VOL. XXXVI. NO. 141.] [JANUARY, 1927.

MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY

I.—LOGICAL CONSTANTS.

BY J. A. CHADWICK.

BEFORE focussing our attention upon logical constants themselves we ought perhaps to take a bird's-eye view of some of the surrounding territory which forms, as it were, their setting or context. That is, we require a certain minimum of information in answer to the questions: "*What is a fact?*" "*What is a universal?*" and "*What is an existent?*"

So I will—very tentatively—state what seems to me at present to be the least improbable view in regard to these three closely connected questions.

I.

We know a fact when we know that such-and-such is the case. And what is the case either will be that an assigned thing has such-and-such a simple non-analysable property or will be that an assigned thing has such-and-such a relation to one or more other assigned things. The property or relation in question I shall in future refer to as "the principal universal of" the fact. Thus if it is the case that the sun is being eclipsed, and we take this to be the fact that the moon is between the earth and the sun at such-and-such a time, then a possible analysis of this fact will be into a triadic relation—"being linearly between"—as principal universal and three other entities which are related by that relation, one of the three being an event in the history of the moon, and the other two being events in the history of the earth and of the sun respectively.

Analysis of any given fact, therefore, will reveal one and only one entity (*viz.*, a simple non-analysable property or

relation) functioning as its principal universal. The remaining entity or entities yielded by analysis will, in the case of some facts, be existents (such, for instance, as events in the moon, the earth, and the sun in our example of the eclipse); but in the case of other facts I am going to suggest that they may be properties or relations—*i.e.*, that they may be universals, although not functioning as the principal universal of the fact in question.

Facts may be *about* portions of Space-Time (such as the above-mentioned events in the respective histories of the moon, the earth, and the sun). On the other hand, nothing which is not an existent can be said to be *in* Space and Time, taking the most literal and direct sense of "in". For whatever connexion a fact has with Space-Time arises out of the spatio-temporal characteristics of one or more existents that are arrived at in analysing the fact. Also, whatever connexion a property or relation has with Space-Time is similarly dependent upon existents which possess the property or are related by the relation. But I should not feel it safe to rule out the bare possibility that there may be existents which are neither in space nor in time. For example, the selves or spirits into which (according to McTaggart) the Absolute is differentiated would be existents enjoying a timeless and non-spatial existence. Consequently I have to fall back upon the admittedly questionable *a priori* distinction, being left with the bare assertion that existents *are* in a different logical category from universals—their distinctive mark being that they are ineligible for the post of principal universal in a fact. Or, as Mr. Johnson[1] expresses it, an existent "cannot characterise but is necessarily characterised".

It may be said, then, that only one rôle is open to an existent in a fact, while two rôles are open to a universal (that is, a universal can enter into a fact in either of two ways, an existent in only one way). This distinction must of course be reflected in the ranges of propositions which are values for a propositional function; and that reflected distinction is, in my view, the "obscurely felt difference in regard to ranges of propositions" to which Mr. Ramsey (if I have rightly understood his recent papers) ascribes the philosopher's habit of taking for granted the distinction between universals on the one hand and existents (or particulars) on the other.

To return to the concrete facts which make up Reality and from which universals and existents are, so to speak, extracted. A possible way of regarding these *facts* may be expressed—somewhat vaguely, I fear—under three headings, as follows:—

[1] *Logic*, Part II., p. xii.

(1) Each single fact, taken by itself, has a certain sort of unity and coherence; it forms, so to speak, a *closed* system.

(2) But a fact is never a simple indivisible unity. It can always be analysed into two or more entities, though in itself it is something more than a mere aggregate or collection of the structural units into which such analysis decomposes it.

(3) Lastly, the structural units which analysis distinguishes within a fact do not all stand on an equal footing, since there is always just one that functions as the principal universal of the fact.

If we want a crude image to illustrate this view we may think of the principal universal as part of a wheel, namely the hub, spokes, and metal rim, which is waiting to be covered with a solid rubber tire so as to form the completed wheel. The completed wheel represents the fact as a coherent *closed* structure. A rim to which the solid rubber tire has to be applied all in one piece represents a simple non-analysable property; for example, let a certain patch in your visual field be referred to as "this," and suppose it is in fact a red patch; then to its being the case that this is red corresponds the completed wheel, to "this" (*i.e.*, to the patch in your visual field) corresponds the single bit of rubber which is the tire, while to redness (supposing it to be a simple non-analysable property) corresponds the metal rim. Also, to pursue still further the analogy afforded by our model, a metal rim to which the solid rubber tire has to be applied in two sections will represent a dyadic relation, one to which the tire has to be applied in three sections will represent a triadic relation, and so on.

Suppose we have a metal rim which requires N separate pieces of rubber to be attached to it in order to produce a completed wheel; then this metal rim represents an N-termed relation. When all the pieces of rubber except one have been attached to the metal rim we obtain a representation of what may be called an "analysable" property (as distinguished from a simple non-analysable property). For example let us put N equal to 3, and let our three pieces of rubber represent entities A, B and C, and let the metal rim represent the relation of "giving" (which is a triadic relation). Suppose it is the case that A gives B to C. Then if only the pieces of rubber which correspond to A and C are attached to the rim we shall obtain a representation of the analysable property "being a gift from A to C". And this property belongs to B. It will of course *also* belong to another entity D, if it is a fact that A gives D to C.

II.

We have just been considering the triadic relation of "giving" as holding between A, B and C. Suppose now that A is replaced by the property of redness and that C is replaced by the property of squareness, while B is something—namely a patch in your visual field—which is both red and square. We are thus supposing it to be the case that B is both red and square. What will be the analysis of the fact that B is both red and square?

I take the analysis to yield, on the one hand, the three entities B, redness, squareness, on the other hand a triadic relation which relates together these three entities and which is the principal universal of the fact. The triadic relation, which is the principal universal of the fact that B is both red and square, is one specimen from a set of relations that will in future be referred to as "relations of conjunction". I assume that every conjunctive fact has as its principal universal one of these relations of conjunction.

The sentence "B is red and D is square" may be taken to have the same meaning as the sentence "D is square and B is red," so that the same fact is recorded by both (supposing that any fact is recorded at all). In other words the two sentences merely differ in the order in which the clauses "B is red" and "D is square" occur, and this difference in the symbol is irrelevant to what is symbolised—that is to say, does not play any part in the symbolising. Now the conjunctive fact, which may be indifferently recorded by either of the above-mentioned sentences, will have as its principal universal a tetradic relation of conjunction; the other entities yielded by its analysis will of course be B, redness, D, squareness.

Relations of conjunction form the first of the four sets of logical constants which we shall have to consider. But, instead of taking the notion of "and" as fundamental, it might perhaps seem equally satisfactory to take the notion of "or" (as is done in *Principia Mathematica*). However, Mr. Johnson, in an article which appeared thirty-five years ago (see MIND, N.S., vol. i., p. 6), has defended the choice of "and" as being philosophically the simplest and most ultimate. In that article he is treating simple (that is, non-molecular) propositions as unanalysed units, and he is regarding the conjunction "and" as a relation between propositions. He asserts: "The fundamental mode of logically combining propositions is represented by the conjunction 'and' . . . The relation expressed by 'and' is simply the *emptiest* of all rela-

tions. It expresses merely the bringing of two propositions together into one system, without subordination or any definable connexion other than is indicated by their being face to face in one and the same system."

Part at any rate of what Mr. Johnson's phrases about absence of "subordination" and of "any connexion other than is indicated by being face to face in one and the same system" are intended to convey, may be explained as follows. Given two distinct facts P and Q there will also, of course, be the conjunctive fact P-and-Q; and, conversely, given the conjunctive fact P-and-Q there will also be the fact P by itself and the fact Q by itself. This puts the conjunctive fact P-and-Q more on a level with the fact P by itself and with the fact Q by itself. In the case of other compound facts—such for instance as P-or-Q—there is not so simple and straightforward a connexion with the fact P by itself and with the fact Q by itself.

Again, I may know the fact P-or-Q even if it is not the case that *either* I know P *or* I know Q. Whereas in the case of a conjunctive fact to know P-and-Q *is* equivalent to knowing P and knowing Q.

If we agree to take this notion of conjunction as one of our indefinables, and if we also take the notion of negation as indefinable, we can proceed to define what Sheffer and Nicod have called "the incompatibility of P and Q," and have symbolised by P/Q, as not-(P-and-Q)—*i.e.*, as the negation of a conjunction. The uniformity of this stroke-notation is found to be symbolically convenient in that part of Mathematical Logic which is known as the "Calculus of Propositions". In this notation, for example, not-P is expressed in the form P/P.

The question which arises next is that of the analysis of not-P. Now just as we supposed *conjunctive* facts to be facts having some relation of conjunction as their principal universal, so likewise we shall suppose *negative* facts to be facts having some relation of negation as their principal universal. Thus if we have the fact that B is not green, this fact is to be analysed into B, green, dyadic relation of negation holding between B and green. If we have the fact that B is not larger than D, this fact is to be analysed into B, larger than, D and a triadic relation of negation which holds between B and larger than and D.

III.

So far, then, we have relations of conjunction forming our first set of logical constants, and relations of negation forming

our second set. To these we can at once add a third set, which we will call "relations of impossibility". For every assigned relation of negation there will be a corresponding relation of impossibility, and *vice versa*.

Suppose, for instance, it is the case that B has not got ϕ. Then, if ϕ is a simple non-analysable property, the fact that B has not got ϕ is the fact that B is related to ϕ by a certain dyadic relation of negation. Now B will *also* be related to ϕ by the corresponding dyadic relation of impossibility, if B not merely hasn't got ϕ but, further, *cannot* have ϕ (in the sense that it is logically impossible for B to have ϕ). If, on the other hand, it *is* logically possible for B to have ϕ, the fact that B *may* have ϕ will be a negative fact, and its principal universal will be a triadic relation of negation relating together the three entities B, ϕ, dyadic relation of impossibility.

Again, if ψ is a simple non-analysable property which belongs to B and which is an "internal" or "intrinsic" property of B, then besides the plain fact that B has ψ there will also be the fact that B *must* have ψ, that B's having ψ is logically necessary. The necessity of B's having ψ is the same as the impossibility of B's having not-ψ. Hence the fact that B must have ψ is to be analysed into a triadic relation of impossibility as principal universal relating together the three entities B, ψ, dyadic relation of negation.

It is sufficient to have taken as indefinables the notion of *conjunction* and the notion of *negation* if we wish to study the "Calculus of Propositions" exclusive of Modality. If, however, we want to include the study of modal propositions as well as of plain assertoric propositions, then we shall need to introduce a third indefinable notion; this third indefinable appears as the various "relations of impossibility" in the particular way of analysing which has just been suggested.

Now in many of the logical propositions which we find in the opening section of *Principia Mathematica* the proposition would remain true if *material implication* were replaced (in one or more of its occurrences within the proposition) by *entailing*. For example, the proposition "P implies that Q implies P" might be replaced by the stronger and more determinate proposition "P entails that Q implies P" which is just as good a general truth. (Incidentally, the people who felt the proposition "P implies that Q implies P" to be paradoxical probably did so because they persisted in interpreting it to mean "P entails that Q entails P"—a different proposition altogether and one which is *not* a general truth.) Suppose a fact is recorded by the sentence "P implies Q" (taking "implies" in the sense of "materially implies"). Then that

fact is to be analysed as not-[P-and-(not-Q)]. But, whereas material implication can thus be defined in terms of the two notions of conjunction and of negation, entailing requires the notion of logical impossibility. This can be seen in a general way if one allows "P entails Q" to be interpreted as meaning "P *must* materially imply Q"—*i.e.*, as meaning "It is logically impossible that P should not materially imply Q".

Suppose P and Q are two contingent facts, so that though P and Q are each actually the case it is nevertheless logically possible for P not to be the case and for Q not to be the case; suppose also that P does not entail Q and that Q does not entail P and that not-Q does not entail P. Then we shall have the plain straightforward conjunctive fact P-and-Q, which does not involve Modality. But, in addition, we shall have four more complicated facts which may be recorded by the sentences:—

(1) "P-and-Q is logically possible"
(2) "P-and-(not-Q) is logically possible"
(3) "(not-P)-and-Q is logically possible"
(4) "(not-P)-and-(not-Q) is logically possible."

These correspond to the four "truth-possibilities" which Mr. Wittgenstein talks of in such a case (see *Tractatus Logico-Philosophicus*, 4·3). Mr. Wittgenstein calls "P-or-(not-P) and Q-or-(not-Q)" a *tautology;* and because it expresses agreement with all four of the truth possibilities (remaining true whichever of the four is actually realised), he sharply distinguishes it from anything which he would accept as a genuine proposition. Obviously it does not correspond to any fact about (say) the weather, such as meteorologists want to deal with. For "It will either rain or not rain to-morrow and it will either freeze or not freeze to-morrow" is not one of the contingent propositions which belong to natural science; it is a particular instance of a logical proposition—a particular instance, that is, of a general truth which is logically necessary.

To get rid of "logical necessity" as a separate indefinable notion would obviously be a great advantage. Mr. Wittgenstein proposes to do this by reducing the notion of "being logically necessary" to the notion of "being a tautology". Yet the "truth-possibilities" which he has to talk about are left over as something rather mysterious. Perhaps this puzzle vanishes for those who have grasped his system in its entirety and have thus freed themselves from traditional mental habits. Should, however, the difficulty about his enumeration of truth-possibilities not be purely verbal, then

it would seem as if Modality is simply introduced implicitly instead of being explicitly acknowledged.

On the traditional view Logic guarantees certain propositions (namely those which "belong to Logic" and whatever others are entailed by those) as necessary, but is not concerned either to assert or to deny that other propositions are true without being necessary—are, in other words, contingent truths. Now, Mr. Wittgenstein's view appears to envisage the alternatives:—

(i) No atomic propositions are necessary
(ii) No atomic propositions are contingent
(iii) Some atomic propositions are necessary and others are contingent

and to accept the first of these alternatives on the ground that each one of the atomic facts, the totality of which is the world, is contingent.[1] One might accordingly ask whether (i) is itself a contingent truth. If the answer is affirmative, then Logic remains completely indifferent as to its truth or falsity; yet Logic will still be concerned with the categories of Modality (even though one of these categories happens not to find any application in the actual existing world). But if the truth of (i) is asserted to be necessary, then the notion of being logically necessary will have application (though it will still fail to find application among atomic propositions).

IV.

So much for our first three sets of logical constants. The fourth set are those required in dealing with the notions of "all," of "some," and of "the *ancestral relation* with respect to a given relation".

Let us begin with an example. A pair of human beings who have spoken to one another have to each other a certain relation which does not hold between a pair of human beings who have never spoken to one another. Take two human beings A and B. Suppose it is the case that A has spoken to someone who has spoken to B. Let us analyse this fact into the three terms A, B, the relation of speaking to, and into a triadic relation z_1 functioning as principal universal. Again, the fact that A has spoken to someone who has spoken to someone who has spoken to B is to be analysed into the same three entities A, B, the relation of speaking to, and into a *different* triadic relation z_2 functioning as principal universal.

[1] *Tractatus Logico-Philosophicus*, 1·2, 1·21: "The world divides into facts. Any one can either be the case or not be the case, and everything else remain the same."

Similarly yet another triadic relation z_3 is to be found functioning as principal universal of the fact that A has spoken to someone who has spoken to someone who has spoken to someone who has spoken to B.

Now besides triadic relations occurring in the series z_1, z_2, z_3, etc., there will be just one triadic relation, which we will call Z, that does not occur *within* this series. And the fact that A has to B the ancestral relation derived from the relation of speaking to is to be analysed into the principal universal Z holding between the three entities A and B and the relation of speaking to.

The holding of Z between A and B and the relation of speaking to is entailed by the fact of A having spoken to B. Likewise the holding of z_1 between A and B and the relation of speaking to entails the holding of Z between these same three entities, and similarly for each of the other triadic relations in the series z_1, z_2, z_3, etc.

Conversely, in the case where A and B are not directly related by the relation of speaking to, Z will hold between A and B and the relation of speaking to *only if* one or other of the triadic relations in the series z_1, z_2, z_3, etc., is holding between A and B and the relation of speaking to.

The triadic relation Z is a representative of our fourth set of logical constants, and so also is each one of the triadic relations in the series z_1, z_2, z_3, etc.

Another representative of our fourth set of logical constants is (on the view we are here considering), the relation which *Principia Mathematica* calls "belonging to the field of". For, if R is a symmetrical relation, "B belongs to the field of R" is to be taken as the analysis of the fact that there is some entity to which B has R.

Again, if S is any simple non-analysable relation, the fact that there are entities x and y such that x has S to y is to be analysed into S and a property of "having application" which functions as the principal universal. Analogously, a fact which would be symbolised—in the notation of *Principia Mathematica*—as $(\exists x) \,.\, \phi x$ is to be analysed[1] as "ϕ has application," where it is assumed that ϕ is a simple non-analysable property.

Let us return for a moment to the triadic relation of "giving". Instead of considering the fact that A gives B to C, consider the fact that there is something which A gives to C—*i.e.*, the fact recorded by "There is an x such that A gives x to C". We shall have, as the principal universal of this

[1] This view as to the analysis of $(\exists x) \,.\, \phi x$ is due to Dr. Moore.

fact, a triadic relation holding between A and C and the relation of giving. This relation, which is the principal universal of the fact recorded by "There is an x such that A gives x to C," will be one of the logical constants belonging to our fourth set; and so likewise will the property of "having application" and the relation of "belonging to the field of".

V.

Logical constants are discussed under the title of "purely logical factors" in the following passage from Mr. Johnson's *Logic* (Part I., p. xxiv): "Mathematics is applied logic in a certain very unique sense, for mathematics is nothing but an extension of logical formulæ introducing none but purely logical factors; while every other science borrows its material from experiential sources, and can only use logical principles when or after such material is supplied". Mr. Johnson goes on to explain that it is only in *Applied* Mathematics, where these formulæ have to be applied to Reality, that "a process of thought other than merely mathematical enters in, and intuition is directed to what is given in some form of experience". Whereas, he says, in every extension of *Pure* Mathematics, "no new idea or mode of thought need accompany the work of the calculus. . . . The ideas which enter into the mathematical sciences thus constructed have a form which renders them amenable to purely logical processes of indefinite degrees of complexity; this distinguishes them from the non-mathematical or 'natural' sciences that introduce ideas dependent simply upon brute matter, unamenable to logical analysis, logic entering only in the application to these ideas of classification and the principles of inductive inference."

In contrast to these "ideas dependent simply upon brute matter," Mr. Johnson[1] describes the "purely logical factors" —or logical constants—as *formal* conceptions which are *to be understood by the logician as such.* He instances such notions as red, popular, virtuous, as *not* having to be understood by the logician as such, since they are not essential to the explication of logical forms.

Again, the non-formal qualities and relations of things in the world are contrasted with logical constants when Mr. Russell asserts, of any proposition which belongs to Logic, that "Since it does not mention any particular thing, or even any particular quality or relation, it is wholly independent of the accidental facts of the existent world, and can be known,

[1] *Logic*, Part II., p. 138.

theoretically, without any experience of particular things or their qualities and relations."[1]

Now the phrase "wholly independent of the accidental facts of the existent world" might be applied in a loose sense to such a proposition as "Any two things differ in at least thirty ways" and also to such a proposition as the Axiom of Infinity (when interpreted in the usual way as an assertion that any given finite integer is less than the total number of existents in the world). For—to take the latter example—only logical constants enter into the analysis of the Axiom of Infinity; hence, in this respect, it is independent of the existents and the non-formal universals like red, popular, virtuous, which enter into the analysis of the accidental facts in the existing world. Nevertheless, the Axiom of Infinity is *not* one of the propositions which belong to Logic; it can only enter as a hypothesis into other more complicated propositions which *do* belong to Logic. And the reason is that its truth (if it is true) is not logically necessary, but is a mere consequence of what is empirically the case, of the actual make-up of the existing world. Since it is not in a strict sense "independent of the accidental facts of the existent world," it fails to fulfil one of the essential conditions for "belonging to Logic". The other essential condition for "belonging to Logic" is that the proposition has to be expressible solely in terms of logical constants. For example, if it is the case that this shade of blue is darker than that, then such a fact is necessary; it is not an accidental (that is, a contingent) fact. Nevertheless, something which is not a logical constant, namely the shades in question, enters into its analysis.

In conclusion, I should explain that I am not wishing to confine the term "logical constant" merely to such entities as belong to one or other of the four sets I have been enumerating. For example, the relation of otherness or diversity may be an indefinable logical constant; the "Principia" definition in terms of predicative functions may not be the ultimate philosophical account of the matter. And some of these logical constants not belonging to any of the above-mentioned four sets might exhibit ambiguity of type—just as there is "typical ambiguity" in the case of some of the logical constants that we have already discussed. On the other hand, among universals which are *not* logical constants typical ambiguity never arises.

[1] *Our Knowledge of the External World*, p. 57.

II.—FORMS AND NUMBERS: A STUDY IN PLATONIC METAPHYSICS (II).

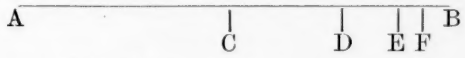
By A. E. Taylor.

II.

The present essay will not attempt to deal with the whole intricate problem of the Platonic theory of the integers and Aristotle's criticisms upon it. It would be absurd to dispose in a few pages of a subject which has cost M. Robin several hundred large pages for the mere full display of the materials for a conclusion. I can, at best, offer a *vindemiatio prima* effected by the *intellectus sibi permissus*. It will be enough to discover, if we can, what the theory must have been in its broad outlines to give rise to the kind of strictures it provokes from Aristotle. We shall gain something if we can see that these strictures are not mere explosions of wilful petulance, and yet that the doctrines which provoked them represent a real advance in mathematical thought, in spite of features which rightly rouse grave misgiving. I believe it will appear from our discussion that the number-theory of the Academy is in much the same position as the Calculus before the purification of it from bad logic in the days of our fathers. The main ideas are sound and fertile, but the formulation given to them involves illogicalities. The remedy for such a situation is neither, with Aristotle, to dismiss the theory on the ground of these illogicalities, nor, like rash admirers of Plato, to pretend that the illogicalities are not there. It is to reconstruct the theory with a more exact and subtle logic, and so to show that its apparent paradoxes are incidental excrescences; the only way to get bad logic out of a philosophical theory is to have more logic, not less.

I start from the assumption, justified by the whole tenour of the Aristotelian criticism, that the doctrine of the One and the "great-and-small," apparently derived from the study of irrationals, was at once extended to the integers themselves. It is always in this form, as a theory about integers, that Aristotle deals with it. We can readily see that the thought of the "real numbers" as limits of series of rationals, once

introduced, would not be confined to irrational real numbers. For the limit to which an infinite series of rationals converges need not be an irrational. Thus, for example, the sum of n terms of the series $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} \ldots$ converges to the value 2, that of n terms of the series $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} \ldots$ to the value $\frac{3}{2}$, and in general, obviously the "sum to infinity" of a decreasing geometrical progression with rational terms is rational. This would be apparent at once from consideration of the process of unending bisection to which Zeno had directed attention. We see at once from a diagram that as the process continues, the successive points of bisection, C, D, E, F . . . , approach nearer and nearer to the terminal B,



and that, since bisection never becomes impossible, we can make the interval between a point of bisection and B less than any assigned interval σ, however small σ may be, by merely continuing the bisection long enough. In other words the sum $1 - \frac{1}{2} - \frac{1}{4} - \frac{1}{8} \ldots$ converges to the value 0 as the number of terms summed increases "indefinitely". It is on this consideration that Eudoxus based the principle of his method of exhaustions, that if from the greater of two unequal magnitudes there be taken more than its half, from the remainder more than its half, and the same process be continued, a finite number of subtractions will leave us with a remainder less than the smaller of the two given magnitudes (Eud. X, 1). The rule implies the knowledge that such sums as $1 - \frac{1}{3} - \frac{1}{9} - \frac{1}{27} \ldots$, $1 - \frac{1}{4} - \frac{1}{16} - \frac{1}{64} \ldots$, converge to limiting values which are rational and not $= 0$ (in the first case to $\frac{1}{2}$, in the second to $\frac{3}{5}$).

In these particular cases, indeed, we do not see the *μέγα καὶ μικρόν*, since the sum of $r+1$ terms of such a series is always less than the sum of r terms. But it is easy to give an example which is a *μέγα καὶ μικρόν*. Thus, take the sum $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} \ldots$ We see at once that it can be written as $(1 + \frac{1}{4} + \frac{1}{16} \ldots) - \frac{1}{2}(1 + \frac{1}{4} + \frac{1}{16} \ldots)$, and that it is therefore $\frac{1}{2}(1 + \frac{1}{4} + \frac{1}{16} \ldots)$, and so converges to the value $\frac{4}{3} \times \frac{1}{2} = \frac{2}{3}$. These considerations prove, as I have said, that if a *μέγα καὶ μικρόν* is a "real number," the "real numbers" cannot all be "irrationals," and that the duty of a sound arithmetical theory is to provide for the derivation of the whole series, including its rational members, on a single principle.

This involves a consequence of the first importance, which has only been definitely realised in very modern times. The

"real number" 2 cannot be the same entity as the integer 2, for the reason that the integers are presupposed as a series from which the "real numbers," including the "real number" 2, have to be derived. Hence no "real number" is an integer and no integer a "real number," though the distinction is concealed by our convenient and economical habit of making our numerical *symbols* do double duty. The reality of the distinction is seen as soon as we attempt to use the method we have been describing to furnish the necessary *definitions* of "real numbers". If I am going to introduce the sign $\sqrt{2}$, for example, I must define it, and if I define it by saying that it stands by *definition* for the value to which the "side-and-diagonal" series $1, \frac{3}{2}, \frac{7}{5}, \frac{17}{12} \ldots$ converges, the very statement presupposes the integers, 1, 2, 3, 5, 7, 12, 17, as already given and known. Since the process of forming "convergents" thus presupposes the integers as the "matter" out of which the convergents are formed by a proper selection, it manifestly cannot be employed to "derive" the series of the integers themselves. Yet, as the history of arithmetic proves, it was inevitable that there should be an initial confusion between the integers and the corresponding "real numbers," and that the necessity of making a rigid distinction should only be discovered by later reflection on the consequences of the confusion. This makes it intelligible why the theory of the derivation of number from the determination of the "great-and-small" should have been extended to the integers themselves. At the same time, it prepares us for the discovery that the simple transference of the notions of the "One" and the "great-and-small," in the form in which they are serviceable in the theory of the irrationals, to the logical derivation of the integers themselves will prove logically unsatisfactory. We are thus in a position to do what many students have found impossible, to be just at once to the Platonic theory as containing the germs of a true theory of whole number, and to the objections of Aristotle. We are neither called on to regard the Platonic theory as a "senile aberration" (the real meaning of the German euphemisms about *Zahlenmystik*), nor, in our admiration for Plato, to treat Aristotle as a mere carper or a pure fool, as I fear even C. Ritter, who has done more than any living German writer for the understanding of Plato, tends to do. It should really be equally incredible that Plato meant anything but a piece of rational mathematics by his theory, and that Aristotle was a mere envier of his master's reputation or a common ass. We shall not look in Aristotle for a mathematician's appreciation of mathematical new conceptions, but

we shall look for, and we shall find, intelligible protests against something which, on the face of it, appears to conflict with the logic of common sense. We shall be prepared to admit that the criticisms may so far hit the mark as to show that the Platonic new idea can only be "saved" by a re-casting which removes some very fundamental Aristotelian objections. Aristotle, no doubt, was one of those numerous persons who cannot follow a piece of mathematical reasoning until it is turned into the language of "common-sense," but we shall do well to remember the saying of W. K. Clifford that "algebra which cannot be translated into good English and sound common sense is bad algebra."[1]

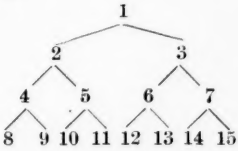
The particular application I would make of this observation is this. It is quite clear that if the proposed conception of a number as a determination of the *ἄπειρον* of the "great-and-small" originated, as we have tried to argue, from consideration of the quadratic and cubic "irrationals," it was extended to cover the case of the integers themselves. It is on the application to the integers that Aristotle's criticisms directly bear. If the "numbers" in question had all been "irrationals," which Aristotle himself followed the older tradition in regarding as *μεγέθη*, or *ποσὰ συνεχῆ*, in contradistinction to *ἀριθμοί* or *ποσὰ διωρισμένα*, he would have been obliged to make the criticism, which he never does make, that the so-called *ἀριθμοί* of which the Academic analysis holds good are not *ἀριθμοί* at all, but *μεγέθη*, and that the definition thus confuses the two *εἴδη* of *τὸ ποσόν*, which are in fact *ἀντιδιῃρημένα*. Again, his apparent standing confusion of the *ἀόριστος δυάς* of the great and the small with the *αὐτὸ ὅ ἔστι δυάς*, the integer 2, would be so gross as to be wholly incomprehensible unless the integer 2 actually played the part of a factor in the derivation of "number," as it can only do if the integers are thought of themselves as having a *δυάς* as one of their factors. If there is a logical confusion of two wholly distinct concepts in Aristotle's strictures, the only reasonable explanation is, though I fear it is one to the neglect of which in the past I must myself plead guilty, that the confusion had been made before him by the Academic champions of the theory themselves, and that his acquiescence in it therefore does not affect the value of his criticism as an *argumentum ad homines*. Thus when he tells us (*Met. M.* 1082 *a* 12) that "the indeterminate dyad, as they say, lays hold of the determinate dyad and so makes two dyads," this ascription to the *ἀόριστος δυάς* of "doubling"

[1] *Common Sense of the Exact Sciences*, p. 21.

—whether by multiplication or division—what it "lays hold of," where the confusion of it with the integer 2 is manifest, must be an actual piece of the Academic theory, as the words *ὥς φασί* imply. (And, in the absence of any evidence, we are not entitled to maintain that the confusion is not Plato's own but merely that of inferior disciples.) So the type of criticism which is exemplified by the argument of *Met. M.* 1084 *a* 23, that if 4 is the form of horse and 2 that of man, "man will be a part of horse," bad as it is, at least implies that according to the Platonic theory the integers 2 and 4 are among the "numbers" of which the "One" and the *μέγα καὶ μικρόν* are the factors, just as the complaint of the next lines (1084 *a* 25-27) implies that *the* Form-numbers *par excellence* are the integers from 1 to 10. It is still more important to realise the implication of the passage *Met. M.* 1081 *b* 12-22, where Aristotle's point is that in a sound theory the integers must be logically derived in their "natural" order, 1, 2, 3, . . . but "if this is so numbers cannot be derived, as they derive them, from the dyad and the one. For 2 (the dyad) is a part of 3 and 3 of 4, and so on throughout the series. But what was derived from the 'first dyad' (the integer 2) and the indeterminate dyad was the integer 4". The whole point of the criticism is that in the Academic theory, 4 can be defined without defining 3, *i.e.* the Academic deduction of the integers does not give them in their "natural" order. Aristotle's own theory that each number of the series is made from the preceding by adding 1 to it is a piece of very bad logic, but this does not affect the perfect soundness of his contention that a correct theory ought to define the integer $(n + 1)$ in terms of n, and so yield the "natural" order, a point which is fully recognised by Russell when he calls the finite integers those which can be obtained by mathematical induction, and by Frege when he defines the whole series as "the successors of 0". The criticism would be meaningless if the Academy had not defined the numbers up to 10 in an order other than the "natural". This consideration of itself would be fatal to the diagram of the derivation given on p. 31 of Dr. Stenzel's penetrating study of the Platonic doctrine,[1] which does succeed in getting the successive integers from 1 to 10 in the familiar order, and is thus shown to be un-Academic. Dr. Stenzel's method is, in fact, to start with 1, and to derive from it the two next integers, 2 and 3. He then derives two more integers from each of the two thus obtained and

[1] *Zahl und Gestalt bei Platon und Aristoteles*, p. 31.

regards the process as one to be continued indefinitely. We thus get the diagram



The obvious criticisms on this procedure are (*a*) that it disregards the plain indications of Aristotle that the numbers from 1 to 10, the numbers of the "decad," held a privileged position in the Academic theory, and (*b*) that it is not clear by what sort of derivation the author supposes himself to be getting his new integers from an old one at each step. He apparently thinks that, *e.g.*, the application of the "indeterminate dyad" to 1 produces 2 and 3, its application to 2, 4 and 5, and so on. But this is flagrantly at variance with the express statement (*Met. M.* 1082 *a* 14) that the function of the *ἀόριστος δυάς* is to be *δυοποιός* of whatever it "gets hold of". You cannot make 3 from 1 or 5 from 2 by any process of doubling or halving.[1] Presumably Dr. Stenzel's thought is that, since his method somehow always derives from any integer n the two integers $2n$, $2n + 1$, the transition from n to $2n$ is always the work of the dyad which is *δυοποιός*. Exactly how the transition from n to $2n + 1$ is to be described is not clear. I suppose it illustrates the function of the other constituent of number, the "One". But if the Platonic method of generating the odd numbers had been Dr. Stenzel's, it would have been a criticism Aristotle could hardly have missed that half the integers, on the theory itself, *are* got by the "addition" of a "unit". I find this irreconcileable with Aristotle's insistence on the "addition of 1 to 1" as a point which, it is implied, was not recognised in the Platonic theory, and also with his statement that the function of "the One" was supposed to be that of "equalising" something, a statement for which we have already seen the evidence. I am thus driven to conclude that, though all Dr. Stenzel says in his book about the importance of the definition of an *ἄτομον εἶδος* by the process of logical division is of the highest value, he has gone astray in supposing that we can directly

[1] One might add that Aristotle's language seems to make it plain that 2 was not supposed to be derived from 1 by "doubling," but was, like 1 itself, assumed as a datum. He clearly means to say that the first and simplest example of the "doubling" power of the "dyad" was supposed to be given by $2 \times 2 = 4$. See *infra*.

discover the Platonic theory of the logical structure of the integer-series from the teaching of the *Sophistes* and *Philebus* about διαίρεσις κατ' εἴδη. (Perhaps he has forgotten also that the *Philebus* is clear on the point that διαίρεσις does not proceed necessarily by dichotomy. We divide a "kind" into the fewest sub-kinds necessary at each step, but not necessarily, as the *Sophistes* had done, always into two and no more, *Philebus* 16 *d*.)

What is meant by "equalising" I think we can see best from the use of the same word in connexion with the doctrine of "directive justice" in the fifth book of the *Nicomachean Ethics*. It will be remembered that the main thought there is that the commission of a wrong creates an inequality between two parties who were before, and ought to be, equal. *A* has now an advantage and *B* a disadvantage, and the business of a dicastery, in assessing its award, is to transfer to *B*'s side of the account with *A* just so much as will cancel the inequality and leave the parties in the state of "equality" which existed before *A*'s unlawful act. This is done by striking a kind of "arithmetical mean".[1] So much is clear, whatever view we take on the special points about which interpreters have diverged from one another. There is another equality besides absolute or arithmetical equality, that which Aristotle calls "equality of proportion," and Plato in the *Gorgias*, "geometrical equality," but when "equality" is spoken of without qualification it means absolute equality, and when "equalising" is spoken of in the same unqualified way, what is meant is the taking of an arithmetical mean. The arithmetical mean between b and a, $(a + b)/2$ (where I assume $b > a$) is said to "equalise" this because the difference $b - (a + b)/2$ is identical with the difference $(a + b)/2 - a$.

If we apply this to the case of numbers, we see at once that it implies that an odd number $2n + 1$ is to be looked on not as the result of adding 1 to $2n$, but as the result of taking the arithmetical mean between the two even numbers $2n$ and $2n + 2$. These two numbers, being both even, are themselves the product of the activity of the "indeterminate dyad" which "doubles" something. The "equalisation" of a great and small is effected by the arithmetical mean, $2n + 1$, because the mean "falls short" of the greater, $2n + 2$ by the same interval by which it "exceeds" the less, $2n$. It follows, I submit, that we are to think of the integers from 1 to 10 as "generated" in the following manner:

(1) The ἀόριστος δυάς, by doubling whatever it "lays hold

[1] *E.N.*, 1132 *b* 10 ff.

of" originates the "power-series" 1, 2, 4, 8, as is clearly taught by what is said of the "double" in *Epinomis*, 990 *e* and *Met. M.*, 1081 *a* 21, *b* 20.[1]

(2) Next we "equalise" the "great and small" by taking the arithmetical mean between the two adjacent even numbers 2 and 4, *viz.* 3.

(3) The double of 3 is next produced by the action of the "dyad," and we get 6.

(4) We now get the "mean" between 4 and 6 and 6 and 8; this gives us 5, 7.

(5) The "dyad" lays hold of 5, and this gives us 10.

(6) Finally we obtain the "mean" between 8 and 10, 9.

The resulting order is thus 1, 2, 4, 8, 3, 6, 5, 7, 10, 9, and we note that the odd integers, apart from 1, are all got by what is really division by 2, $2n + 1$ being regarded as $\frac{1}{2}(4n + 2)$; the even integers are got, apart from 2 itself, which will be considered later, by multiplication by 2. Thus the series once more illustrates the phrase of *Epinomis* 990*e* *ἀεὶ περὶ τὸ διπλάσιον στρεφομένης τῆς δυνάμεως καὶ τῆς ἐξ ἐναντίας ταύτῃ.* We must add to what we have already said about this phrase that the whole integer-series is produced by doublings and their inverses, halvings.

There is just a little uncertainty about the precise arrangement of the five last terms of the series. We might get 5 before 6, if we supposed that step (2) covers the insertion of a "mean" between 2 and 8, as well as a "mean" between 2 and 4. And 6 itself might again be got, not as 3×2 but as the "mean" between 4 and 8. Or again, we might try to get the odd numbers 3, 5, 9 immediately after the series 1, 2, 4, 8 by "limiting" the advance of the "doubling dyad". The third step would then be the doubling of 3 and 5, and the fourth and last the "limiting" of the "advance" of the dyad from 6. Thus we should get an order given by Robin (*Théorie Platonicienne*, p. 282), 1, 2, 4, 8, 3, 5, 9, 6, 10, 7. But the evidence seems to me to indicate that *only* odd numbers are derived by the process called *τὸ ἰσάζειν*, and against the last suggestion we have the double consideration that it destroys the *symmetry* of a regular alternation of multiplication and "equalisation," and also that it obtains

[1] 1 is supposed to be given already as a datum needing no derivation. I have spoken, for brevity's sake, as though 2 is to be taken as the result of an application of the *ἀόριστος δυάς* to 1. This is the view which ought in consistency to be taken of 2, if the underived constituents of the integers are the "One" and the "indeterminate dyad". I shall give reasons later on for thinking that in fact the "dyad" was only used to obtain even numbers greater than 2, and that 2 itself was treated, though it should not have been, as a primitive datum of the theory.

'he odd numbers by a method which Aristotle would have described as the addition of 1 to 1. If half the integer-series had actually been derived by the Platonists in this way, it seems to me that Aristotle could not have failed to make the telling objection that it is illogical to scruple at getting all the integers by the method you yourself employ for getting half of them. Yet he never makes any such point, but assumes rather that it is characteristic of the Academy to make no use whatever of "addition of 1 to 1". And, in fact, on the view adopted here, this is the case. Unless we make an exception for 2, no term of the series has been simply derived from that which immediately precedes it in the "natural" order. Hence I believe that the order we have given is the one really intended. It is the same as one given by Robin (*op. cit.*, 447-9), and I think the method of obtaining it described there is identical with that given above, though Mr. Robin does not notice the use of *ἰσάζειν* in the *E.N.*, and does not explicitly explain that one of the two operations involved is the taking of the "mean". Hence I did not myself see the superiority of this arrangement over that proposed *op. cit.*, 282, until I happened to reflect on the use of *ἰσάζειν* in the *Ethics*.

If the reconstruction thus attempted is sound in principle, it should show us that there is real point in Aristotle's criticism. Several of his contentions must in fairness be allowed to be valid. (1) Thus though he is manifestly in error in supposing that the higher integers contain the lower as "parts" of themselves, and more generally in thinking that an integer n which is > 1 is a collection of n "units," he is wholly right in objecting to any number-theory which generates the integers in any but their "natural" order. To say nothing of the practical inconvenience of having to prove separately the endless "inequalities" which we should require to establish if we started with such a series as Plato's method would give us, it is a *logical* fault in the theory that it requires two distinct principles of method for the generation of the integers, the operation $\times 2$ for the even, and the operation $\div 2$ for the odd. Both, no doubt, may be said to be operations with the "double," but they are different operations, one the inverse of the other, and operations, like *entia*, are not to be multiplied *praeter necessitatem*.

And there really is a single formative principle which governs the logical structure of the whole series of finite integers; they have a definite type of order, different from any other, which it is important to recognise. It is only when they are arranged in the "natural" order that we see at once what this

type is, that of a "well-ordered" infinite series, *i.e.* one in which there is a first term and in which every term has one and only one next suceeeding term. That you could not discover this in an integer-series constructed by what seems to have been Plato's method is obvious. The order of the first five integers would, indeed, be unequivocally fixed as 1, 2, 4, 8, 3. But we might doubt whether the immediate successor of 3 should be got by "equalising" 2 and 8, so as to yield 5, or by applying the "dyad" to 3 so as to yield 6. It is not clear what the "integer next after 3" on this scheme is. Mathematicians recognise the soundness of Aristotle's point when they define the finite integers as those which can be reached by "mathematical induction," or "induction from n to $n + 1$". Aristotle's error in supposing that because a collection of $n + 1$ things contains n things and 1 thing over, the integer $n + 1$ contains the integer n and a 1 over does not affect the real force of his criticism. He is in precisely the same position as Berkeley and others who condemned the Calculus for employing the notion of "vanishing" magnitudes. They were quite right in saying that the theory of the Calculus, as formulated by its exponents, introduced vanishing magnitudes which are treated as somethings which are turning into nothings, and that to talk of such nothing-somethings is to talk nonsense. But the criticism really hit not the Calculus itself but only the inaccurate analysis its exponents had given of their own method. So Aristotle's criticism affects not the thought the Academics were trying to express, but the faulty expression they gave to it. His appeal to the process of counting as indicating the lines on which a correct logical theory of whole numbers should proceed (*Met. M.* 1080*a*, 30) is perfectly sound; unfortunately, it destroys his own doctrine of the generation of the integer-series by successive additions of 1, since we do not count, "one, one, one, one . . .," but "one, two, three . . .," as he has to admit in so many words.

(2) Again, it seems to me probable that Aristotle is not himself to be made responsible for the curious confusion of the number 2 with the *ἀόριστος δυάς* which runs through so much of his argumentation. When we compare the statements that 4 is produced "as they say," from the "first dyad and the indeterminate dyad" (*M.* 1081*b*, 21), that the indeterminate dyad, "as they say," laying hold of the determinate dyad makes two dyads, for its character by definition is to double what it lays hold of (*τοῦ γὰρ ληφθέντος ἦν δυοποιός*, *M.* 1082*a*, 12-14), that *ἡ ἀόριστος δυὰς δυοποιὸς ἦν* (*M.* 1083*b*, 35), it seems impossible to doubt that the Platonists, and pre-

sumably Plato himself, definitely regarded multiplication by 2 as the work of the *ἀόριστος δυάς*. And here there clearly is a bad mistake in logic. There is nothing "indeterminate" either about the process or about the result of "doubling". It is true, indeed, that multiplication in arithmetic is strictly, like addition, an operation on collections, not on the cardinal numbers of the collections. But the operation is one which has a perfectly determinate rule, and when both the collections involved are finite, as in the case of the "multiplication of 2 by 2," there is no *ἀπειρία* anywhere in data, process, or results. The data are collections of classes of two members each, the process is that of forming the "logical product" by combining each member of each of the two classes with each of the other, and the logical product is a class with the determinate number 4. The combinations of couples which can be constructed out of the members of the couples (*a*, *b*) and (*c*, *d*) are (*ac*), (*ad*), (*bc*), (*bd*), and no others. Thus it should be the "first" or "determinate" dyad which is both multiplier and multiplied, and Aristotle is justified in making difficulties about the appearance of an "indeterminate dyad" in the character of multiplier. 2 is not an "indeterminate coefficient."

(3) And this leads to a further problem. What about the "first dyad," the integer 2, itself. If 4 results from the operation of the "indeterminate dyad" on 2, does 2 result from its operation on 1? Or must we regard 2, the "prime dyad," as an original datum for the theory, by the side of 1 and the *ἀόριστος δυάς*? From the very passages of *Met. M.* which have just been cited above, when we remember that there are no similar allusions to a "laying hold of" 1 by the "dyad," it seems to me clear that the "doubling" of 2 was supposed to be the first example in the integer series of the working of the *ἀόριστος δυάς*. And the same thing, as I still think, is the only possible explanation of the perplexing remark of A. 987*b*, 33, that Plato made one of the constituents of his numbers a "dyad" because numbers are so easily generated from it, as from a matrix—*ἔξω τῶν πρώτων*. The *πρῶτοι*, which form the exception to the statement, are, I think, certainly 1, the "unit," and 2, the "first dyad". We have seen already that all the others are very easily "generated" by combining the two operations of multiplying by 2 and finding an arithmetical mean. *If* the first operation of "doubling" you will admit is the multiplication of 2 by 2, of course 2 itself, like 1, will not be one of those so generated. And since, as Aristotle implies, the Platonic theory forbids you to generate 2 by "adding 1 to 1," obviously you *cannot*

"generate it" by a multiplication of 1 by 2, thus presupposing 2 as one of the factors which generates itself. You must assume that 2 is there as something "given," no less than 1. And this leaves you with three underived data instead of two, 1, the "indeterminate dyad," 2. These difficulties are really inseparable from the attempt to make "doubling" the function of the "indeterminate dyad," and are therefore justly chargeable not on Aristotle, to whose memory I would hereby make an *amende honorable* for former utterances, but on the πρῶτος εἰπών, Plato himself.

The real source of the trouble is a curious one. It is that 1 is a term of the series of "powers" of every number whatever, that, as we express it, $x^0 = 1$, whatever number x may be, or, differently expressed, that $\log_x 1 = 0$, for all values of x. The mere statement of the point makes it clear that the first step to a theory which would avoid both the illogicality of confusing 2 with a couple of 1s, and the necessity of assuming 2 as well as 1 as a datum for the construction of the integer series, could not be taken until the notion of an arithmetical zero was clearly formed, that is, until it was understood that there is an "integer 0," and that 0 is the first of the whole numbers. But, though the Academic conception of the line as the "fluxion" of a point, like the Platonic name for the "point," ἀρχὴ γραμμῆς, shows that Plato and his followers had definitely conceived of a zero magnitude which is the geometrical analogue of the "number 0," the very fact that "the One" was treated as an underived constituent of number, this "One" being, as Aristotle's criticisms plainly show, regarded as identical with the number 1, proves that they had not thought of replacing 1 as the first term of the integer-series by 0. Hence the integer 2 creates a great difficulty for their number-theory. Once you have got 2, as we have seen, you can easily go on to "derive" all the other even integers. But how are you to get your original 2? There seems nothing for it but to presuppose that it is given as a datum needing no derivation. And yet, even if one winks at the ascription of "doubling" to the wrong "dyad," the "indeterminate," one's logical sense must be shocked by having to hold that one is not to regard $1 \times 2 = 2$ on the same footing with $2 \times 2 = 4$. If one does assimilate the two propositions, one would be led straight to the identification of the 2 by which 1 is multiplied in the first equation with the "indeterminate" dyad which ἦν δυοποιός. The ambiguity about this "dyad," which seems at once to be and not to be the integer 2, is thus not due to a blunder on Aristotle's part; it is inherent in the Platonic account of number itself.

Yet the thought at the bottom of the theory is far too valuable to be surrendered. We cannot fall back, like Aristotle, on the view that an integer n is a "sum" of n 1s, since that is manifestly nonsense. No integer contains the integer 1 or any other; it is strictly true that integers are not *συμβλητά*, and that our language about adding them to one another is a convenient and inaccurate abbreviation. When we say that $7 + 5 = 12$, what we really mean is that if we have a collection a with 7 members and another collection b with 5 members, and proceed to form the "additive class," "things which are either a or b," the cardinal number of this new class is 12. If there are 4 greater prophets and 12 minor prophets, there will be 16 persons in the collection of persons who are prophets, major or minor. But there is no number 12 or number 4 in the number 16. It is the two sets of prophets, not their cardinal numbers, which are "addible".

The importance of the Platonic theory, in spite of the easily recognised logical difficulty about the two "dyads" is perhaps best brought out by stating it in a way which throws its apparent paradoxicality into the strongest relief. It refuses to employ addition as a means of generating numbers, but employs multiplication and its inverse operation, division. This shocks common sense, which regularly looks on multiplication as an equivalent to repeated addition, regarding $x \times y$ as an abbreviation for $x + x + x \ldots$ to y terms. Yet the view implied in the Platonic theory is a sound one and that of common sense unsound, though we should never discover the fact in our practical operations with numbers. So long as we are concerned only with finite integers, it is true that multiplication may be treated as no more than a compendious substitute for repeated additions. But when we look into the logical character of the two operations, we shall see that it is not the same; logically multiplication is an independent operation with a principle of its own. In addition, as has been already explained, what we really do is to form a new collection which has for its members those and those only which were members of one or the other of two original collections. The fundamental logical process is that of forming the notion of the collection "a or b" from the notions of the collections a and b. In multiplication, on the other hand, when we multiply the collection a by the collection b, the underlying notion is that of the "multiplicative class," and this is generated on a totally different principle. We combine each member of a with each member of b to form a couple; the number of couples thus obtained is the number

of the "product" of a by b, each couple being one of the members of the "multiplicative class".[1] Thus $5 \times 3 = 15$ means that if we have five things, a, b, c, d, e and three things α, β, γ, 15 is the number of distinct couples in which one member is taken from the group a, b, c, d, e, and the other from the group α, β, γ. The logical process underlying addition is disjunctive, that which underlies multiplication is combinative. The extraordinary method by which the Platonists appear to have constructed the δεκάς arises from an over-hasty application of a truth which is, in itself, of the first importance.

To return to the construction of the integer-series itself. It is manifest that the curious process by which the successive integers are reached in an order which is not the "natural" one cannot stand against the criticism of common sense. The fatal objection to any such construction is that the "natural" series of the integers is a particularly important type of order and that no other arrangement of them exhibits the type in the same transparent way. Thus, suppose we have already completed the δεκάς and wish to continue the series. We shall first have to apply the "dyad" to 6, the lowest integer to which it has not already been applied, and this will give us 12. Then by "equalising" 10 and 12 we get 11. But the procedure obviously implies that we already know that there is one and just one empty space to be filled between 10 and 12, that there is a "number next after 10" and that it is also the number "next before 12". And this, in turn, implies that the integers in their "natural" order are already known before the process of derivation by means of the "dyad" begins. We cannot condemn "common sense," speaking through Aristotle, for finding such a construction incoherent. Indeed, if the contention of our former essay was correct, and the method really originated from an attempt to determine the value of "irrational real numbers" in terms of the integers, the transference of it to the derivation of the integer-series itself was morally bound to lead to incoherence. If a "one" and a "dyad" are to be discovered as the constituents of the

[1] Here and elsewhere in this essay, I am, of course, wholly unoriginal, merely repeating, in a rough and approximate way, what the reader will find put with full scientific precision in works like Whitehead's and Russell's *Principia Mathematica*, Russell's *Principles of Mathematics*, Frege's *Grundgesetze der Arithmetik* and the like. To readers who know these works I apologise for dragging in what is so much more competently given there, on the ground that many persons who are interested in Plato seem too much frightened by the titles of such works as I have named to consult them for themselves.

integers themselves, they cannot be identical with the "one" and the "dyad" which figure in the derivation of the algebraic "surds"; at best, we can only expect the analysis of the formation of integers to reveal constituents which function in an analogous manner. The confusion of the analogous with the identical has already met us as characteristic of Greek number-theories in the form of the identification of the real numbers 2, 3, . . . with the corresponding integers. It is only what we should expect that the same logical confusion should encounter us again in the ascription of the function of "doubling" to the "indeterminate dyad" instead of the "first dyad," which has led to so much of the Aristotelian criticism. On the other hand, we cannot regard Aristotle's justified objections to the theory as any justification of his own view that integers are generated by "addition of 1 to 1". If we neglect the confusion between integers and the collections of which they are the numbers already spoken of, there is still a simple difficulty which is enough to annihilate this "common-sense" explanation. If I say "how many are 1 and 1 and 1 and 1?" I am asking a question which I cannot answer unless I am already acquainted with the series 1, 2, 3, 4. To count, I have to know that when, *e.g.* in this illustration, a stop is made in the repetition of the words "and 1," the *fourth* "1" has been reached, and no other. Once more, the integer-series is tacitly assumed as already known in the very theory offered to describe its generation. One might have seen this from the simple reflexion that we do not learn to count as children by saying "one, one, one . . .," but by saying "one, two, three. . . ." I can only learn by counting on my fingers that "1 and 1 and 1 are 3," if I have already learned to count the fingers as "one, two, three . . ." Hence the first task of an arithmetical kind for a young child is to get the names "one, two, three . . . " *in their right order* stamped on its memory, and it is very amusing to listen to children as they acquire certainty about this order by repetition, and to observe how hard they find it not to miss out some of the terms or to invert their order.

If we analyse the actual method by which we can successively define each of the integers in terms of the preceding, we shall see that, in fact, it may be said to be dependent throughout on the notions of a "one" and an "indeterminate" dyad, or great-and-small. What functions as the "one" is the notion expressed in language by the indefinite article "a" or "an," and what functions as the "dyad "is the notion expressed by "any". These are not, of course, the same things as integers of any kind; in particular "a" does not

mean "one"; it is a notion already possessed by the youngest child who can point to a thing and say "ball" or "dog," long before it has even begun to learn to count. Given these elementary notions we can proceed to derive the integers in order in the way regularly followed by modern philosophical writers. Roughly the procedure is as follows.

We begin by defining the first member of the series, 0. To do this we need, besides the notion of "any," the general logical notions of true and false and of a propositional function and its "arguments".[1] By a propositional function, for our purposes, we mean whatever can be significantly asserted about anything; we denote it by such symbols as ϕ, ψ, χ, written before a pair of brackets. By an argument to a function we mean anything of which the assertion in question can be made so as to yield a significant statement. Such arguments may be denoted by the symbols, a, b, c . . . and when we wish to consider the function alone, leaving it an open question whether any argument can be supplied which converts it into a true statement, we may indicate this by using the symbols x, y, w . . . Thus, *e.g.*, $\phi(x)$, may mean "is bald," $\psi(y)$, "is infallible," etc. Thus if a denotes Julius Cæsar and b the Pope, $\phi(a)$ will be the proposition "Julius Cæsar is bald," $\psi(b)$ the proposition "the Pope is infallible." So much premised, we might define 0 by saying that if every proposition $\phi(a)$, $\phi(b)$ . . . is false, the number of the "values of x which satisfy $\phi(x)$" is 0, by definition.

We may then go on immediately to define 1, in terms of the conceptions used in our definition of 0, thus: 1 is the number of "values" which satisfy $\phi(x)$ if (1) some proposition of the form $\phi(a)$ is true, and (2) "$\phi(b)$ is true" implies that b is identical with a. If this is the definition of 1, we can proceed at once to define 2 thus: 2 is the number of values of x which satisfy $\phi(x)$, provided that, (1) some proposition of the form $\phi(a)$ is true, (2) some proposition of the form $\phi(b)$, where b is not identical with a, is true, (3) if $\phi(c)$ is true, either c is identical with a or c is identical with b.

More generally, when once the integer n has been defined, we proceed to define its immediate successor $n + 1$ by the conditions that $n + 1$ is the number of values which satisfy $\phi(x)$ if (1) there are n distinct arguments a, b . . . n, such that $\phi(a)$ is true, $\phi(b)$ is true . . . $\phi(n)$ is true; (2) $\phi(p)$ is

[1] Here again I am, of course, simply borrowing as much as is necessary for my purpose of the terminology of Frege, Whitehead and Russell, and am aiming at no more precision than is strictly necessary for my immediate purposes. I may give a general reference to the first chapter of the *Introduction* to *Principia Mathematica*, Vol. I., and to Frege's essay *Function und Begriff*.

true and p is not identical with a, not identical with b, . . . not identical with n; (3) if $\phi(q)$ is true, either q is identical with a or is identical with b, . . . or is identical with n, or is identical with p. Thus, what I mean by saying that there were three triumvirs is that the two propositions, "Octavian was a triumvir," "Antony was a triumvir" are true (Octavian not being the same person as Antony); that the proposition "Lepidus was a triumvir" is true, and that Lepidus was not Octavian nor yet Antony; that if there is any person of whom it is true that he was a triumvir, that person is identical with Octavian, or identical with Antony, or identical with Lepidus. *E.g.*, it is true that Augustus was a triumvir, but that is because Augustus was the same person as Octavian; it is true that M. Aemilius was a triumvir, because M. Aemilius was Lepidus; or, to put the matter in a different way, $\overline{n+1}$ is the number of members of a collection if it includes a collection with n members, if it has also a member which is not a member of this collection of n members, and if whatever is a member of it is identical either with some member of the collection of n or with the member, not included in the collection of n, mentioned in the last clause.

All this is wholly trite and familiar and I only repeat it here for the sake of making the following points clear. (1) the notion "a" or "an" is not the same as the notion "1," as is shown by the fact that we have to use it as part of the definition of 1. To put it quite popularly, "There is one reigning King of England" means "there is a reigning King of England—George V—*and there is no other*". (2) The notion of "any" is not the same as the notion of "all". It means "any you may please to take," "any which turns up," not "each and all". Hence we can employ it in cases where it might be doubtful whether we could speak of "all," a definite totality. In speaking, *e.g.*, of "any integer" we do not commit ourselves to the view that there are propositions which can be significantly made about "all integers" or "every integer". We can speak significantly of "any region of space" without by implication denying Prof. Alexander's view that space is not a "whole". This is why there is no logical fallacy involved in the use of the notion "an" as a datum presupposed in the definition of the integer 1; it is also why the notion of "an" by itself, without that of undefined plurality, would not be sufficient for the definition of 1, and why, for example, the belief that "there is a God" is not the same as the belief that God is one.

If the Platonic line of thought was really that which has been indicated, we can see that though, in a sense, it is true

that the "material" of the integers is a "great-and-small" or "indefinite duality," in fact, the concept of indefinite multitude, the actual working-out of the thought has committed the double confusion of this duality or dyad with the integer 2, and of the antithetic notion of "an" with the integer 1. Were there no numbers but the integers to take into account, the older Pythagorean analysis which made the constituents of number limit and the unlimited and treated the "unit" or integer 1 as itself the simplest combination of these constituents might fairly be held to be more satisfactory than the amended version of it which presupposes 1, and apparently 2, as initial data calling for no derivation, and so enables Aristotle's criticism to get home. This seems to me good ground for supposing that the necessity of the modification was due to the fact that Plato and his friends started from the consideration of something other than the integers, and that their theory of the derivation of the integers was a further development motived by the desire to transfer to number as a whole a theory originally adapted to the special case of the irrationals So long as the "real and rational" numbers are not distinguished from the integers, it is inevitable that, *e.g.*, the integers 2, 3 and the irrational real numbers $\sqrt{2}$, $\sqrt{3}$ should be regarded as terms of one and the same series subject to one and the same law of derivation. The confusion which seems to play havoc with the theory is one which could not have arisen if it were the case that all the values to which infinite series converge were irrational. The integers and the "real numbers" would then have stood out as two distinct series and there would have been no temptation to bring both under a single formula. And here, again, we may do a tardy justice to the stalwarts of the older tradition who, like Aristotle, insisted that though there may be irrational geometrical magnitudes (*μεγέθη*), there are no irrational *ἀριθμοί*. If their distinction on this point between geometry and arithmetic had been obstinately sustained by the mathematicians, the development of modern mathematics would have been impossible. The one-to-one correspondence of points in a plane with couples of real numbers which is the very foundation of Descartes' analytical geometry would have been ruled out. Yet, at bottom, there is a real justification for their protest against the "new" arithmetic of the Academy, though they do not express the justification in the right way. What they are trying to say, is something which is quite true, that the integers and the real numbers are two distinct series and that no term of the one is a term of the other. The important principle embodied

in the insistence on this radical distinction between *ἀριθμοί* and *μεγέθη* is that the real numbers cannot be obtained from a set of logical data by the method which yields us the series of integers, the "inference from n to $n + 1$," "mathematical induction." This is both important and obvious. "Inference from n to $n + 1$" presupposes that $n + 1$ has a determinate meaning, *i.e.*, that in a series derived by this method every member has one determinate "immediately next" member, as is the case with the integers. The integer-series is the standing type of a "well-ordered" infinite series, satisfying the conditions that there is a first term of the whole series and that every term has one and only one term which is next after it. It might appear, at first sight, that the series of rational fractions does not conform to the type, since there is, *e.g.*, no rational fraction which, in what we call the order of magnitude, comes next to a given fraction. But, as is well known, we may rearrange the rational fractions in such a way that the condition is satisfied. Thus if I begin the series thus, $\frac{0}{1}, \frac{1}{0}, \frac{0}{2}, \frac{1}{2}, \frac{2}{1}, \frac{2}{2}, \frac{0}{3}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{3}{2}, \frac{3}{1}$ . . . , it is manifest that I can continue the series endlessly and that by the law of its formation, every term has a definite next following term, and that no rational fraction will appear more than once, and none will be omitted. (The same thing would be true, if for brevity's sake, one suppressed all the fractions with 0 for their numerator after $\frac{0}{1}$ and reduced all others to their "lowest terms".) Thus the series of rational fractions can be made to correspond one-to-one to that of the integers, and so has the same "ordinal number". But the case is altered when we come to the real numbers. It is true that the "algebraical" real numbers, those which are the roots of equations with integral indices and rational coefficients, can be arranged as a well-ordered series, and that the real numbers known to the Academy, the quadratic and cubic surds, are only an infinitesimally small selection out of this multitude (Couturat, *de l'Infini Mathématique*, 622 ff.). But when we take into account the whole "real number" series, including the "transcendent" as well as the "algebraical" real numbers, the correspondence with the integer-series breaks down. The continuum of real numbers appears definitely not to be a well-ordered series. Attempts have been made, including one by the late Philip Jourdain in MIND, to show that it must be possible to arrange it as one, but to the layman, like myself, these proofs have a suspicious appearance of assuming the conclusion, under a thin disguise, as a premiss for its own demonstration, and they do not seem to have convinced the mathematicians. And it is suggestive

that their authors never seem to have ventured to put their view to the test by producing a sample segment of the continuum of real numbers re-arranged by their own methods. We may probably take it as certain that the continuum of all the real numbers is a series of a type different from that of the integers or any series whose terms can be made to correspond one-to-one with the integers. It is, at any rate, certain that we cannot logically derive the series from that of the integers by the methods by which we can develop the integer-series itself or derive from it the series of rationals or that of *algebraical* real numbers, which have the same type as the integer-series itself. Neither Aristotle nor the Platonists he criticises could have known this, but it is the real justification of his stubbornness in opposition to them, though it is amusing to recollect that, as we saw in our former study, the only "irrationals" with which Aristotle was acquainted, the quadratic and cubic surds, *can* be derived from the integers by the methods to which he objects and that the whole series of algebraical real numbers has the same type of order as the integers. The strength of his position on this point only appears when we take into consideration the "transcendent" numbers of which he could have had no conception. (Of course I am not forgetting the simple fact that a transcendent number can be expressed as the limit to which a series of rationals converges, as when we write $\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} \ldots$ *ad infin.* We could not calculate them, if this were not so. What I mean is that, on the one hand, such a series itself is not yielded by the method Plato appears to have contemplated, but presupposes acquaintance with the exponential and logarithmic functions, and, on the other, that the difference of order-type between the integers and the continuum of the real numbers is the vital difference embodied, though Aristotle could not know the fact, in his own contrast between *ἀριθμοί* and *μεγέθη*.)

To sum up, then, the main points I offer for consideration are these:

(1) The peculiar Platonic theory of the constitution of number probably originated in the conviction that the quadratic and cubic surds which figure in geometry, especially in the solid geometry created by Theaetetus, compel us to recognise "irrational numbers". As an historical point, we might conjecture that the prominence given to the topic of irrational *μήκη* in the *Theaetetus* may very possibly indicate that Theaetetus himself, in the Academy, influenced the development of Plato's convictions in this direction.

(2) Probably the character of the theory was determined by the fact that it started from knowledge of a rule for finding the successive "convergents" to $\sqrt{2}$, regarded as a "continued fraction". The anticipation was that all quadratic and cubic "surds" could be treated by this method, and it is from the alternation of convergents which are alternately too small and too large that the notion of the "indeterminate duality" has arisen.

(3) Owing to the fact that the values to which such infinite series converge need not be irrational, it was inevitable that the "rational" real numbers should be confused with the integers, and that the attempt should be made to extend the theory to the whole field of known numbers, the integers and the quadratic and cubic surds, regarded as a single series.

(4) But the extension to the integers involves a deformation of the theory which leads to confusion of "the One" and the "indeterminate dyad" with the integers 1 and 2, and the unfortunate assigning to this "dyad" of the function of "doubling," which should really have been connected with the "auto-dyad" or integer 2. It also involves deriving the integers in an arrangement other than their "natural" order, for two reasons. The powers of 2 have to precede the other integers of the decad, and further no odd number $2n + 1$ can appear until $2n$ and $2n + 2$ have already been obtained. A number $2n + 1$ will always follow *after* $2n + 2$.

(5) Hence Aristotle's criticisms, so far as they concern these features of the doctrine, are justified. There is also a certain justification, unknowable to Aristotle himself, for his insistence on the distinction between *ἀριθμοί* and *μεγέθη*.

(6) At the same time, the Platonic formulæ, as applied to the integers themselves, correctly anticipate two important points of a true number theory, the necessity of a strict derivation of the integer-series from more fundamental logical notions and the logical independence of multiplication on addition.

(7) The identification of the forms (*εἴδη*) with numbers means that the "manifold" of nature is only accessible to scientific knowledge in so far as we can correlate its variety with definite numerical functions of "arguments". The "arguments" have then themselves to be correlated with numerical functions of "arguments" of a higher degree. If this process could be carried through without remainder, the sensible world would be finally resolved into combinations of numbers, and so into the transparently intelligible. This would be the complete "rationalisation" of nature. The process cannot in fact be completed, because nature is

always a "becoming," always unfinished; in other words, because there is real contingency. But our business in science is always to carry the process one step further. We can never completely arithmetise nature, but it is our duty to continue steadily arithmetising her. "And still beyond the sea there is more sea;" but the mariner is never to arrest his vessel. The "surd" never quite "comes out," but we can carry the evaluation a "place" further, and we must. If we will not, we become "ageometretes".

III.—TIME AND THE ABSOLUTE.

By J. S. Mackenzie.

It can hardly be denied that the problem of Time is the most difficult in the whole range of philosophy. To deal with it at all satisfactorily involves reference to nearly every other philosophical problem. It may seem hopeless, therefore, to attempt to deal with it in a short paper like the present. I have been partly led to do so by the fact that recent advances in physical science have thrown a good deal of fresh light upon the whole subject; and partly by the fact that reflexion on the speculations of a number of independent thinkers—Eastern and Western, Ancient and Modern—has convinced me that it has become much more possible than it was even a few years ago to put together a certain amount of material from different sources that yields what may almost be described as a common doctrine on the general problem.

Some of those who have dealt with the difficulties about Time, and who have been most deeply impressed by them—*e.g.*, Plato, Shankara, Kant, Bradley and McTaggart—have sought to meet or evade them by saying that Time is unreal, that it is merely an image of eternity, that it is essentially illusion or appearance, that it has only a phenomenal existence or a limited degree of reality; and there may be a sense in which some of these statements can be accepted. But, on the whole, they can hardly be regarded as much better than evasions of the difficulties. Even an illusion or appearance can hardly be thought of otherwise than as occurring in Time. It would seem to be of the very essence of an appearance that it at least does appear. It can hardly be supposed that it only appears to appear. What is commonly called in India Maya, which is generally understood as meaning illusion, has always been thought of, and surely must always be thought of, as somehow occurring. To suppose, as McTaggart did, and as some others also have apparently done, that what seems to occur in a certain sequence is, in reality, all there at once, still leaves the fact that for us it comes in a successive series without any real explanation.

Succession has to be admitted at some point.[1] Now, I am fully conscious of the difficulties that are involved in the recognition of a real succession; and I cannot pretend to be able to remove all these difficulties. Some degree of ultimate mystery may have to be acknowledged. I believe, however, that some philosophers have gone a considerable way towards the clearing up of the mystery; and, if it cannot be said that any one has quite succeeded in solving all the puzzles that are involved in it, I am convinced at least that an attempt to bring together some of the most important speculations may help us to see the general direction in which we may look for a solution. Xenophanes, almost at the very beginning of philosophical speculation in Greece, said that his statements were guesses that might be something like the truth. It is in a similar spirit that I should wish my own statements to be taken.

I may begin by saying that the scientific theory that has recently been brought forward by Einstein, according to which our Universe—now commonly referred to as the spatio-temporal system—is to be regarded as almost inconceivably vast, but still definitely limited and capable of exact measurement, has seemed to me extremely enlightening; and I understand that, in its main features, it is now generally accepted as an established truth. To me at least it has come as the welcome verification of what I had long believed on purely philosophical grounds. It opens up the way for the acceptance of the distinction, which has seemed to me to be quite essential, between our Universe and the much larger conception of a Cosmos. On Einstein's theory itself, however, in all its somewhat elaborate details, I do not venture to pronounce an opinion. Some of its expositors—even some of those who are generally regarded as the most reliable—have interpreted it as involving very startling paradoxes which are revolting to common sense and do not seem to me to be necessarily implied in the general doctrine. Einstein's own statements, so far as they are known to me, seem to be comparatively free from these paradoxical aspects; and they do not seem to be necessarily involved in such interpretations as those that have been given by Prof. Whitehead, though even these are to some extent puzzling. But it does not appear to be necessary for my present purpose to attempt any discussion of the details of the theory, which belong rather to science than to philosophy. A general observation,

[1] For further difficulties in the theory of the unreality of Time, I may refer to Prof. Sorley's excellent paper in MIND (April, 1923).

however, upon the recent developments of physical science may be worth making at this point. Philosophers must, of course, be loyal to the discoveries that are made in the special sciences, so far as they appear to be well authenticated.

The chief difficulties in earlier attempts to understand the Cosmos—especially in Western countries—seem to have arisen from a too limited view of the extent of the problem. When the Greeks spoke about the Universe, they generally had in mind only a small part even of the little planet on which we live. Later thinkers, no doubt, have had a more comprehensive outlook. But, even when Leibniz speculated about the best of possible worlds, it was little more than the life of human beings on earth that he had in mind. Pope, who sought to give a popular interpretation of Leibniz, stated definitely that 'the proper study of mankind is man' —a limitation that it is now hardly possible to accept. Even a good deal later, Hegel was inclined to treat everything beyond our earth as of little interest or importance. Hardly any one now would think it possible to give a coherent interpretation of the Cosmos within such narrow limits. But, until the more recent scientific discoveries had been generally accepted, it was at least customary to think of the spatio-temporal system as containing within itself the whole of reality. It was, no doubt, thought of as extremely large. It was even commonly described as infinite. Among recent writers of deservedly high repute, Prof. Alexander has taken this view decidedly; and Mr. Bertrand Russell regarded it as not improbable. Mr. Russell at least now recognises that this view is hardly tenable.[1] The change in this particular respect may, no doubt, be said to involve a contraction, rather than an expansion, of our conception of the spatio-temporal system; but it may be doubted whether any one ever had a clear conception of what could possibly be meant by an infinite system. It could hardly be taken as anything more than a verbal expression. Hegel was surely right in holding that the mathematical conception of infinity has no metaphysical significance.[2] At any rate, the recognition that

[1] I understand him to admit this in his little book *What I Believe*. It may, of course, still be supposed to be tenable with regard to the Cosmos as a whole; and I think this is what Prof. Alexander means. He is not necessarily referring to our spatio-temporal system. He thinks of a more comprehensive system, the same in kind.

[2] This was one of the points at which McTaggart diverged from Hegel; but it still seems to me that Hegel was right. It is not, however, a subject that can be here discussed. According to Hegel, the philosophical meaning of infinity relates to internal completeness, rather than to unlimited extension. There are, of course, difficulties about this which will be, to some extent, referred to later.

our spatio-temporal universe is limited and measurable makes it easier than it formerly was to recognise that that system, vast as it is, is not the whole of the Cosmos. The distinction, however, between our Universe and the Cosmos—which seems to me to be of supreme importance in metaphysical speculation—has been so little present to the minds of our Western philosophers that it is not possible to make much use of their theories for the present purpose; and we have to turn rather to Indian thought, in which the antithesis seems to have been nearly always more or less clearly present. Among British philosophers, F. H. Bradley is perhaps the one who has come nearest to the recognition of it—if, indeed, he may not be said to have recognised it fully. He expressed it by the antithesis between Reality and Appearance; and he did not regard the latter as purely illusory, but only as an inadequate expression of the former. The terms that are most commonly used in India are Brahman and Maya, for which we have perhaps no quite satisfactory equivalents. The nearest equivalent for Brahman is the Absolute, and the nearest equivalent for Maya is Appearance or Illusion. Brahman, however, is definitely conceived as spiritual and might consequently be identified with the philosophical conception of God; but it is less misleading to identify It with the Absolute, in the sense in which that term is used by Bradley and some others. Maya, on the other hand, tends on the whole to be thought of as more purely illusory than Bradley's appearance.[1] Shankara was the writer who most definitely insisted on the purely illusory character of the world as commonly experienced; and he seems to have been the most influential of Indian thinkers on the purely philosophical side. Ramanuja, who came a good deal later and whose influence, though very great, was less strictly intellectual, did not conceive that the world of our ordinary experience is illusory, and hence avoided the use of the term Maya altogether. The influence of his teaching is seen chiefly in writers of a devotional type, such as Govindacharya, or in poetical interpretations of experience such as we get from Rabindranath Tagore. But the term may be used in the sense of Appearance, without necessarily implying that what appears is wholly illusory. It is doubtful indeed whether

[1] Sir John Woodroffe thinks that Maya meant originally what is measured, *i.e.*, the Finite or Particular; but this is probably erroneous. It seems to have been always interpreted as Illusion or Appearance—perhaps originally as a sort of magical deception. There appear to be two distinct roots of the form Ma, one of which means measure and the other magic or illusion; and it is from the latter that the philosophical term has been derived.

even Shankara held it to be illusory in any sense other than that in which Bradley spoke of Appearance.[1] In what is here to be urged, I think it will be convenient to make some use of these Indian terms, mainly because they are less familiar to us than their nearest English equivalents, and do not carry with them so many misleading associations. Maya may be interpreted as meaning exactly what our spatio-temporal Universe is now scientifically regarded as being—*i.e.*, as a definitely limited system, which is by no means unreal, but which is nevertheless very different in its nature from what it appears to be on a superficial view.

Brahman is generally understood to mean a Being of transcendent powers, not completely comprehensible by us, but having to be conceived as essentially spiritual; and, if this is to have any meaning for us at all, it must be held to imply the possession of those characteristics that appear to be distinctive of spirit, though always with the proviso that they must not be understood quite in the sense in which they can be applied to human beings. It must be recognised that they are, to some extent, like the gods of Lucretius, *semota a nostris rebus sejunctaque longe;* but, if our conception of them is to have any meaning for us at all, this remoteness must be supposed to refer rather to their eminent degree than to their intrinsic nature. In India these fundamental characteristics are commonly called Sat, Chit, and Ananda (Reality, Insight, and Bliss). In English it is perhaps best to refer to them, in reverse order, as Love, Wisdom, and Creative Power. In interpreting Sat as meaning Power, I am following the account that is given by Rabindranath Tagore, especially in his book called *Sadhana*. Goethe has declared, in his well-known poem *Das Göttliche*, that it is only on the analogy of human nature that we can guess at the nature of any higher Beings that we may conjecture as existing; and it is such a guess that I am here endeavouring to give. Of course, such a Being as is here referred to cannot be supposed to exist in the sense in which finite beings exist—*i.e.*, to exist in space and time or indeed *in* anything else. Existence must be taken to mean rather the presence of a pervasive influence. Love and Wisdom, on the other hand, being essentially spiritual attitudes, can more easily be identified with characteristics that may belong to finite spirits existing in space and time. For this reason it may be best to begin with some reference to these attributes.

[1] Prof. Radhakrishnan interprets Shankara's general view as being substantially identical with Bradley's.

It would seem that Love and Wisdom are characteristics that may be supposed to belong, even in the most eminent degree, to many beings ; whereas Power, in the most eminent degree, can hardly be supposed to belong to more than one. Many beings may be supposed to be in Heaven, or, to use an Indian expression, to attain to Nirvana ;[1] and it is difficult to attach any definite meaning to these terms except as implying an attitude of Wisdom and of Love or Bliss. They do not refer to any place or person, but to a spiritual attitude; and there seems to be no ground for supposing that many beings may not attain to such an attitude. On the other hand, it seems hardly possible to suppose that the highest degree of Creative Power could belong to more than one. Hence it seems possible that many spiritual beings, perhaps even all spiritual beings, may be or become identical with Brahman in two of the characteristics that are ascribed to that Being, though not in the third. In this sense it seems possible to understand the view that has often been maintained, that there may be several persons in the Divine, or even that all spiritual beings may contain the Divine in potentiality. But it would seem that this does not apply to the aspect of Power.

Now, if we assume the reality of a Being having the attributes that are ascribed to Brahman, it seems clear that the attributes of Love and Wisdom imply the existence of beings distinguishable from Brahman; while the third attribute implies the possibility of bringing such beings into existence. The existence of some sort of world or universe or cosmos is thus implied; and we have to ask by what process such a system may be supposed to have come into being. We have to try to form some intelligible hypothesis about this.

It would seem that the most obvious way in which such a process may be conceived is that which was characterised by Howison (and more tentatively by Ward) as the 'creation of creators'. The beings thus created must be supposed to lack something of the Power of Brahman; but they need not be supposed to be deficient in the other attributes of the

[1] It is very possible that I am misinterpreting this term (as well as some of the others); but the interpretation that I am giving to it seems at least to have the support of Prof. Radhakrishnan. Those who, like Sir Henry Jones, have adopted the expression 'I and the Father are one,' can hardly be supposed to claim more than a certain identification with the Absolute in the sense that is here indicated. But it seems to be a very questionable claim for any human being to make. It is at least doubtful whether even the Founders of the great religions intended to make it. Still, as Ophelia said, 'we know what we are, but we know not what we may be'.

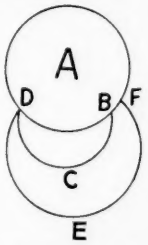
Divine. Such Beings might be called, in a phrase of Bradley's, 'finite centres'; or they might perhaps be identified with what McTaggart described as 'fundamental differentiations of the Absolute'. It may be that neither Howison nor Bradley nor McTaggart would have approved of the use that is thus made of their conceptions; but it is the best way in which I am able to interpret their meaning. Thus we pass from Brahman to a hierarchy of spiritual beings, each with the vision of the eternal, and each endowed with a limited Creative Power. The finite Universes may be supposed to be the creative expressions of such beings.

It is not easy to understand how the limitations of such Finite Centres are to be conceived; but perhaps the modern scientific conception of our Universe may help us to an interpretation of those limitations. According to Einstein's theory, the Spatio-temporal system is to be thought of as a self-contained but limited Universe. The general nature of that Universe is further conceived as broken up into relatively distinct modes of grouping, descending downwards to centres of electro-magnetic activity. There seems to be no definite reason for supposing that this particular structure is the only one that is conceivable or possible. It suggests rather a certain arbitrariness. If we suppose this Universe to be the creation of a Finite Centre, we may perhaps regard the electro-magnetic activities as the material with which that Being has to work. We are thus brought to a conception similar to that which was suggested by Plato in the *Timæus*[1] —that of a Demiurge working with an imperfect material. We may also connect it with what Hegel says about the 'weakness' of Nature. Other Universes may have other weaknesses. Perhaps it is inevitable that what is created can only be an imperfect expression of the Power by which it is created. The plays of Shakespeare are an expression of his outlook on the Cosmos; but they express it in a way that is imperfect and in some respects arbitrary. We can to some extent account for these defects. On the other hand, the apparent arbitrariness in the structure of our Universe does not appear to be capable of any definite interpretation. Some are inclined to postulate an element of Contingency

[1] I am not necessarily implying that the views set forth in the *Timæus* are to be accepted as Plato's own. Doubts have been raised about this by some recent commentators. I may add here that I have not ventured to refer to Plotinus. Much fresh light has been thrown upon his views in recent years, very notably by Dean Inge; but I must confess that I have not yet succeeded in gaining a quite clear view of his system. It seems clear, however, that it is largely based on the *Timæus*.

or Chance; but this is only an evasion of the problem. It seems better to confess that it is due to some limitation that we do not understand. If there are other universes than ours, a consideration of the relations between them might be expected to throw light upon the problem; but for the present at least we know of no way in which such knowledge could be made accessible to us, and so we have to content ourselves with the recognition of an element of contingency. But this need not prevent us from seeing that, within its limitations, our Universe has a definite plan; and it is not easy to interpret a design without some conception of a designer. This designer is what I understand by a Finite Centre.

The mode of operation of such a Centre may perhaps be made more intelligible by the help of a diagram, though of course such a diagram can only be taken as a very rough indication of what is meant.



The circle at the top marked A is intended to represent one of the Finite Centres that we have to postulate. It may be convenient to continue to use some Indian expressions in the characterisation of it; and accordingly we may call it Brahma, as distinguished from the more impersonal Brahman, though it must be remembered that we are supposing that it is not the only personal source that has to be postulated for the interpretation of the Cosmos. For the present we are confining our attention to our own spatio-temporal system.

The smaller curve BCD is intended to indicate the time that may be supposed to be occupied in preparing the plan of our Universe; but the time occupied in preparing this has to be distinguished from the time of the spatio-temporal system itself. It must be taken as corresponding more nearly to the time that Bergson thinks of as preceding the generation of space. To indicate this distinction it is here represented as flowing in the opposite direction from DEF, which is meant to indicate the time of our Universe.

The idea of a pre-existing plan perhaps calls for some explanation; and it may be made more intelligible by the use of an analogy. If our Universe is to be conceived in the way that is here suggested, its nearest analogue is to be found in the creation of a work of art; and a somewhat complex work of art will serve as the best illustration. We may select Goethe's *Faust* as probably the most suitable for the purpose. It may be said, without much exaggeration, to have been the work of his lifetime; and it was, perhaps more than any other work of art has ever been (with the possible exception of the *Divine Comedy*), the complete expression of the particular finite centre from which it proceeded. He may thus be thought of as being in a position somewhat similar to that of the Creator of a Universe. He began to think about his great poem at a very early stage in his life and he was working at it almost up to the end; but we may say that, in the production of it, there were three main stages. At first we may suppose that what he had in mind, apart from the traditional forms of the story, was only a general conception of human life as a process in which certain ends are achieved through innumerable difficulties and errors. Next he had to devise a plan of the process through which that end might be supposed to be attained. Finally, he had to work out a number of elaborate details (much too elaborate perhaps for a work of art), by which the general plan is particularised. We may suppose that in the evolution of our Universe there is a somewhat similar, but much greater, complication. There is first, we may conjecture, a general conception of the Good (in Plato's phrase, *αὐτὸ ἀγαθόν*), based upon the vision of the self-existent Life (*αὐτὸ ὃ ἔστι ζῷον*). Then the Finite Centre or Demiurge has to develop a plan,[1] through which the Good may be gradually realised; and finally this leads on to the definite time-process, with all its innumerable details, and the limitations that are imposed upon it by the general nature of the material that has to be employed, through which, by the agency of still more limited creative spirits, the great goal is, within the measure of the powers that it contains, reached at last. When that goal is finally achieved, we may suppose that the spiritual beings by whose agency the result is realised, sink back into the eternal peace of Brahman, 'where all things transient to the changeless win'.

[1] It is perhaps not necessary to suppose that this plan is rigidly worked out in all its details. It would seem at least that it leaves scope for creative choice on the part of the lower finite centres. But to discuss this is beyond the range of the present paper.

If we regard the matter in this way, the activities of the finite centres seem intelligible enough. It is the conception of Brahman that presents the greatest difficulty. So long as we are concerned only with finite centres, even if we suppose them to be involved in the creation of a Universe, we can refer them to a definite origin and we can think of them as operating through a definite process. But it would seem that that which contains the ultimate Source and the ultimate End has to be thought of as eternal and uncreated. The child's question 'Who made God?' continues to be a riddle for the speculative philosopher; and to ascribe any kind of life to the Divine or Absolute seems to derogate from Its unchangeable essence. The question of origin, however, can perhaps be disposed of without much difficulty. The answer may be said to have been quite finally and satisfactorily supplied by Hegel, in so far as he has been able to show that Spirit is self-explanatory—the only thing that can be taken to be real in its own right. I take this to be the outcome of his *Logic;* and for the present at least we must assume that it has been satisfactorily shown, or to be only open to such criticisms in detail as those that have been urged by McTaggart and others. But, as Hegel himself puts it, it is only 'God before the creation of the world' that is reached by the *Logic*. When a creative process is introduced, we seem to have entered into the region of transience. McTaggart avoids this difficulty by regarding the 'fundamental differentiations of the Absolute' as there from the outset, and by representing the time process as unreal. But 'fundamental differentiations' do seem to call for explanation; and, as I have already urged, it is not easy to see how the time process can be supposed to be altogether illusory. His view is that what appears to us as a process in time is in reality a scale of values, the lowest values being at the beginning and the highest at the end. But it is difficult to think of values without an element of real process. Moral values at least seem to depend on activities in time; and æsthetic values seem to involve some element of creation. Moreover, it is not easy to see, from the point of view of value, why the lower values should have any existence at all if they are not necessary for the production of the higher. Evil appears to be quite gratuitous if it is not a condition for the realisation of Good. For these reasons we seem bound to admit the reality of a time process; and we must try to meet the difficulties that are involved in it.

The chief difficulty, so far as I can see, is that the idea of growth seems to imply imperfection; and it does not seem

wholly satisfactory to say, as Sir Henry Jones did, that perfection may involve imperfection at the start. Perhaps the difficulty may be met by the supposition that the end is presupposed in the beginning. If we think of the Absolute as being primarily a vision of perfection, we may suppose that vision to persist in its essence unchanged from beginning to end. The process may be thought of as furnishing the details that are from the first presupposed and that are apprehended retrospectively at the end. If value implies creation, it seems clear that it implies time; and it certainly appears that it does imply creation. If so, we must frankly recognise that the Absolute cannot be thought of as entirely statical; and indeed I can hardly imagine that any one has ever succeeded in thinking of a perfect Being in that way. Of course, it will be objected that otherwise the Absolute has to be conceived as imperfect to start with. The obvious answer is that the perfection of any Being is only to be found in its whole nature. To separate one part from another is illegitimate. Perfection is not to be found either in the beginning by itself or in the end by itself, but only in the creative process as a whole. The value of the beginning lies in its anticipation and potentiality; the value of the end lies in its retrospective vision; and the intervening process has 'the glory of going on'. The complete value lies in the whole; but it lies in the whole as a *living* whole. But it may be objected that when the end is reached, the process must be supposed to be no longer in being. The earlier values have thus been lost. The answer is, I think, that they are retained, with their sting extracted, in the retrospective vision, which may be supposed to be eternal.

It is hardly necessary to say that I am not professing to understand how the perfection of the Absolute is to be conceived. If to understand means to have a complete comprehension, I must confess that such comprehension seems to me to be quite unattainable by us. But I do not see any actual self-contradiction in the view that is here suggested; whereas there appears to be a self-contradiction in any theory that denies the reality of process.

It may be asked why this process may not be conceived as proceeding straight from the Absolute without the intervention of any 'finite centres' or 'fundamental differentiations'. The answer is that, if the nature of the Absolute has been rightly conceived, It cannot be supposed ever to rest in a state of solitary blessedness. The 'creation of creators' has to be thought of as involved in Its nature from the beginning; and this, it would seem, can only be conceived as a descending

series. There are, of course, many other questions that might be raised in connexion with this—such as that with regard to the persistence of finite centres; but such questions would carry us far beyond the scope of the present paper. As, however, I have been referring a good deal to the views of Hegel and his interpreters, and also to the general conception of our Universe that has been most definitely introduced by Einstein, it may be well to add a little more in justification of the references that have been made to their doctrines.

I do not know whether the general view that I have been attempting to indicate can properly be characterised as Hegelian. There are different interpretations of Hegel; and I do not presume to say which is the right one. I have already indicated my opinion that the Hegelian philosophy is defective from the lack of the conception of a multitude of finite worlds or universes—a conception that was only made definitely tenable by the discoveries of Einstein. Yet at least Hegel's references to the weakness of Nature seem to imply that the world to which he was referring was conceived as a limited and imperfect one. Perhaps it is also a legitimate criticism on Hegel's philosophy in general that he lays undue emphasis on thought—an emphasis that has led some not wholly unsympathetic critics to characterise his philosophy as a Panlogism. I do not think that it is rightly so described; but it may be well to add a few words on the grounds that have led to such a characterisation of it.

It seems true to say that the transition from the intellectual conceptions that are discussed in the *Logic* to the very limited facts of nature as partially exhibited in the particular features of our little planet, is too abrupt. Some further account of the particularising process is evidently called for. At the time when Hegel wrote, it was hardly possible to supply this; and it may be admitted that he was somewhat rash in attempting it, though there are some elements of value[1] in his imperfect sketch. It must be admitted also that some of his interpreters in this country have expounded his system in a misleading fashion. Hutchison Stirling was the first who sought to reveal the 'Secret of Hegel' to English readers; and it is probably true to say that he laid too much stress on the power of Universals. Several other interpreters may also be charged in some degree with the same defect; and it ought perhaps to be confessed that Hegel himself did

[1] These have been skilfully brought out in Mr. Stace's recent book on the Hegelian philosophy.

not sufficiently guard against such misrepresentation.[1] On this it may be well to make some further observations at this stage.

It may be allowed that Thought, as distinguished from the more comprehensive conception of Spirit, is somewhat unduly emphasised throughout the Hegelian system. McTaggart—perhaps the most acute of Hegel's commentators—emphasised Love, rather than Knowledge, as the ultimate characteristic of the Absolute; and objected on this account to the view that philosophy should be regarded as the final form in which the significance of reality is expressed. With this I am disposed to agree. But I agree also with the contention that the modification that is thus introduced is quite in accordance with the spirit, though perhaps not always with the letter, of the Hegelian system. It is evident from Hegel's earlier writings, as well as from some of the later ones, that he conceived himself as providing a spiritual, and not a purely intellectual, interpretation of the Cosmos; but it is probable that this was to some extent concealed by certain errors into which he was led; and to some of these a brief reference may here be made.

There is a certain ambiguity in the German word 'Geist,' as there is also, though in a different way, in the French 'esprit'. The English word, like the Indian 'Atman,' is, on the whole, free from any similar defect. Geist, of course, corresponds, in general, to Spirit; but it will be remembered that Wallace was constrained, in some of his very admirable translations of Hegel, to render it by Mind rather than by Spirit. Now, Mind may no doubt be taken as an equivalent; but it tends, on the whole, to have a more purely intellectual sense. When Tennyson speaks of 'mind and soul according well,' we readily understand that he is referring to a harmony between the intellectual and the more emotional or affective aspects of our spiritual nature. Now Geist, though rather more nearly equivalent to Spirit than to Mind, has often to do duty for the latter as well, for which there is no quite satisfactory word in German. Hence it is liable to take on a more purely intellectual signification than Spirit usually has; and I am disposed to think that Hegel was to some extent misled by this. McTaggart, by laying special emphasis on Love, gave a more definite place to the more affective aspect of our conscious life. He might perhaps have added that the more active or creative aspect of consciousness is also insufficiently brought out by Hegel.

The defect to which reference is made is already apparent,

[1] The interpretation of Hegel given by Dr. J. E. Turner in his *Theory of Direct Realism* seems to me, in the main, quite sound.

I think, in Hegel's *Logic*. Indeed, the very use of the term *Logic*, as characterising the fundamental attitudes in the interpretation of reality, is somewhat misleading; and it has been made more misleading by the common use of the term 'Categories' to describe the fundamental attitudes that are dealt with in the Logic. Hegel himself called them rather *Denk-bestimmungen*, determinations of Thought; and he conceived that these determinations of thought are unfolded, not only in the Logic, but in the historical development of philosophical systems. Whatever else he may have failed to do, he was at least the first who succeeded in making the history of philosophy intelligible, by showing that it is not a mere succession of conflicting opinions, but a gradual unfolding of more and more comprehensive interpretations of reality. In these interpretations the conception of value plays an important part. It is only necessary to refer to Plato, Aristotle, and Leibniz to see that this is emphatically the case; but it tends to be somewhat concealed by a reference to logical categories. Bradley's reference to the 'unearthly ballet of bloodless categories' may be remembered in this connexion. And Bradley was one of the first to emphasise Feeling as an important element in the life of spirit and in the interpretation of the universe.

Again, when Hegel characterised his *Logic* as leading up to a description of 'God before the creation of the world,' he evidently regarded it as providing a place for creative activity. Now Thought, in the more limited sense of that term, can hardly be said to be creative. It does not lead us to particular things, but only to universal aspects of things. Even if we say 'This,' as Hegel himself urged, we are saying something that is quite universal, though we mean something particular. We cannot express our meaning in terms of pure thought, but only by pointing to the particular object to which we refer, or by describing it in a detailed way. What the so-called *Logic* does for us, is to enumerate in systematic order those universal determinations that are presupposed in the existence of particular objects. But it does not tell us how the particular objects come into being; and, in that sense, it may rightly be said to be a characterisation of God *before* the creation of the world. But, if it is to be regarded as such a characterisation, it would seem that it must at least contain the general principle of creative activity. Now, it may be doubted whether Hegel has shown that it does contain this. Herr Krug, it will be remembered, asked Hegel to furnish a deduction of the pen with which he was writing. It would be absurd to expect a deduction of any particular

thing. Only omniscience could supply this; and Hegel did not claim to be omniscient; and indeed he very obviously was not. But it may fairly be asked whether he has provided us with any principle that can account for the existence of particular things at all. He has supplied us with an elaborate system of universals, advancing from the simplest to the most complex and most adequate for the interpretation of reality. It is true that, among these, Particularity has a place. But Particularity, like This, is still only a universal. The particular things in the universe are not merely things that we can think about, but things that we can point to and, in some cases, things that we can make. The God who may be said to exist 'before the creation of the world' must, it would seem, be a God who can make and who has some ground for making. Hegel ought, I think, to have told Herr Krug quite explicitly that he did not pretend to deduce particular things; and he ought to have gone on to explain the grounds that lead to the production of such things.

Now, McTaggart supplied such a ground by the introduction of the principle of Love; for Love is directed to particular things or persons. In introducing this conception, he conceived that he was not departing from the general principles of Hegel's philosophy, but only making more explicit what must be supposed to be implicit in it. In this he was probably right. He was giving a definite place to the idea of Value, which had been somewhat unduly neglected by Hegel; and was thus bringing it more nearly into accord with the philosophies of Plato and Leibniz. But the Platonic conception also hardly seems adequate to creation. To account for creation, Plato had, it would seem, to make use of the conception ofa Demiurge, working with an imperfect material, and the origin of these is not made explicitly apparent. Hegel's solution appears to be no better. Nature, for him, is the sphere of Contingency. His Demiurge (for he has to personify Nature) would appear to be a somewhat fumbling artist, who does his best, but is unable to realise what he would wish to attain; and he has not even the excuse of Plato's artist, for the material with which he works must be supposed to be of his own devising. Or are its apparent defects to be understood as being due rather to the imperfect way in which it is apprehended by the human consciousness? And is this imperfection to be accounted for by the supposition that we can only reach perfection by learning to become creators? This seems to be a possible explanation; but I do not find it in Hegel; just as I do not, at all definitely, find the ideas of Love and Immortality that

McTaggart imported into the system. But I think these two ideas may be admitted to be in harmony with the Hegelian construction; and I believe that the idea of a Power, akin to what we describe as creative imagination, is also in accordance with that spirit, and is even necessary to the completeness of the system.[1] Without such additions, it is quite true that Hegel's philosophy might properly be described as a Panlogism, and would rightly be condemned as not providing us with any explanation of the existence of particular things. McTaggart, as we know, would get over this difficulty by maintaining that, strictly speaking, nothing exists but spirits and parts of spirits; and that their apparent evolution in time is an illusion. That there is a large element of illusion in our ordinary apprehension of things, is made abundantly apparent even by the study of the physical sciences. But even an illusion must have been somehow brought into being. Perhaps there is some further explanation of this in that part of McTaggart's work that has not yet been published. It is pretty clear at least that there is no real explanation of it in Hegel's own system;[2] and to me it seems manifestly impossible to find any explanation without the conception of a creative evolution taking place in time, more or less after the fashion that I have been trying to indicate. McTaggart's view, as I understand it, was that what appears to us in Time is, in reality, a scale of Values existing eternally in the Absolute. I agree that it has to be regarded as owing its existence to the pursuit of an Ultimate Value; but I conceive that the realisation of that Ultimate Value involves a creative process in which there is a real succession; and that, in this sense, Time is real. But how, it may be asked, is this to be reconciled with the modern doctrine of the Relativity of Time? On that a few words must now be added.[3]

[1] This conception has been specially emphasised by Mr. Douglas Fawcett, but perhaps in too paradoxical a way, and without sufficient appreciation of the work of others. His admission of Chance (which is the direct opposite of creation) appears to me to be a fatal defect. But it is one that could be easily corrected. Perhaps the term 'Chance,' like the term 'Emergence,' is to be understood in a somewhat esoteric sense. But 'Chance' is the more misleading of the two. 'Contingency' may be less open to objection.

[2] It is right to add, however, that Hegel was quite well aware that his *Logic* was only concerned with the determinations of pure Thought. The only criticism that can legitimately be made is that he did not give a sufficiently explicit account of the transition from pure Universals to the particulars.

[3] Since this was written, I have read the very interesting book by Mr. I. C. Isbyam on *The Ego and Physical Force*, which seems to me to give

Speaking as a layman, I may state that the only definite conclusion of a general character that appears to have been established by Einstein is that the spatial system is limited and measurable. It has been rendered probable also that the time within which that system can be supposed to endure is, in like manner, limited. That, for certain purposes, Time may be treated as a fourth dimension of Space, was, I believe, known well enough before Einstein wrote. The more definite recognition of the limitations of Time and Space and of the possibilities of their interchangeability for certain mathematical purposes, appears to have led to some important astronomical discoveries. But some have pushed the conception of Relativity so far as to deny that it is possible to have any fixed standards for temporal relations. It has been urged that, strictly speaking, we are not entitled to say that two events in different places occur at the same time. This seems to me to have been too extremely pressed. If a telegram, for instance, is sent from China to England, it takes a certain calculable time in transmission. When this is accurately estimated, it can be quite definitely stated what interval of time has elapsed between the sending of the telegram and its reception in this country. It is not a very long time. It is true, of course, that the time, as determined by the relative positions of the sun, and consequently by the clocks and other instruments of measurement, would be very considerably different in the two countries; but that is surely quite irrelevant. Similar considerations apply to distances much more remote. If a distant star were to be suddenly extinguished, the date of its extinction could be accurately determined from the time at which its light ceased to reach our planet;[1] since the velocity of light is quite definitely known. Similar remarks seem to me to apply to the remarkable fairy tales that have been told about people travelling to remote parts of space and becoming miraculously older or younger than they would have been if they had stayed at home. Surely there are definite methods by which people's

a very clear account of Einstein's theory in its main outlines. He seeks to give a metaphysical interpretation of it by means of ideas derived mainly from the doctrines of Plato, Leibniz, Kant, and Bergson. His discussions seem to me to be extremely well thought out; but they do not appear to yield a quite coherent interpretation of the world-process. It is not possible, however, to give any satisfactory criticism of them here. It must suffice to state that most of what he urges could be reinterpreted from a more Hegelian point of view.

[1] Similar calculations could, of course, be made from the point of view of any other planet; and all the results could be brought together and co-ordinated in some ideal clearing house.

ages could be at least theoretically determined without reference to their positions in space. Perhaps a person's real age could be most accurately ascertained by the number of his heart-beats and other organic processes; and these could hardly be materially altered at any place at which human life could be carried on at all.

It seems also misleading to speak of our Universe as if it were constituted simply by spatio-temporal dimensions. These appear to be purely formal in their nature. Surely there is a material or quasi-material filling of those dimensions; whether that filling is properly to be called Ether or by some other name, and whatever the precise nature of that filling may be.[1] The exact determination of this must, of course, be left to experts, along with those other matters to which I have ventured—perhaps too presumptuously—to refer. From the point of view of philosophy, they have to be accepted as brute facts, undetermined surds—in Hegel's phrase, the 'weakness of Nature,' by which the more purely spiritual activities are hampered and confined.

Setting aside some of the more paradoxical elements in their interpretation, which need not particularly concern us here, we seem to be entitled to state that the general view of the Cosmos that is suggested by Einstein's discoveries, taken in conjunction with the resolution of the atoms into centres of electro-magnetic activities, is that it is properly to be regarded as a Universe of Universes. Even an electron, as Prof. Whitehead has urged, can only be understood in connexion with its sphere of influence. Taken in itself, it would be like Talbot without his retinue. It is a little universe, having only a certain relative independence. Some have thought that we are thus led back to a doctrine akin to the Leibnizian monadology, at least in a modified form like that which was suggested by Ward. It is perhaps too soon to dogmatise about this; but it would appear that a view of this kind emphasises too strongly the relative independence of the smaller universes. It seems safer to regard them as finite centres included within a series of more comprehensive systems. The life of an individual within a social group might be taken as a more or less satisfactory analogue.

[1] I gather that this is now admitted by Einstein and his followers. I suppose, however, that Ether is not a good name for the filling. It is perhaps rather to be supposed that the spatio-temporal system is filled only with modes of energy. But it is surely misleading to speak as if there were nothing but Space and Time as such. The spatio-temporal system cannot be thought of as purely formal. It contains at least what Mill would have called 'permanent possibilities of sensation'.

The creative energy of the Whole may thus be thought of as expressing itself through a series of smaller and smaller systems. This would be entirely in harmony with the general view that is suggested in this paper. Perhaps we have not even now discovered the most minute elements into which material bodies may be analysed. The investigation of this, however, belongs also to the special sciences. Speculative philosophy can only provide us with the most general interpretative principles; and it still seems to me that the most fundamental of these have been, on the whole, satisfactorily provided by Hegel. Caird, Bradley, Bosanquet, McTaggart, and some others, have helped us to reinterpret his main philosophical conceptions; and Einstein and others have helped us to reinterpret them from the more purely scientific side. But the general plan remains as the most fruitful contribution to modern philosophical construction; and it was to some extent anticipated by more ancient systems.

I ought perhaps to confess, somewhat more explicitly than I have done, that there remains an ultimate incomprehensibility in the conception of the Absolute or Brahman. We naturally ascribe to such a Being those attributes that appear to be most fundamental in the finite spirits whom we more or less clearly understand; but it cannot be supposed that they are adequately interpreted by means of this analogy. Such attributes as Love and Wisdom are known to us as operating in the relations of finite centres to other finite centres and to objects within our spatio-temporal system. The attitude of a finite creator, such as Shakespeare or Goethe, to the beings whom he imagined, is already somewhat different in kind from this; and the attitude of an unlimited Creator must be supposed to be still more markedly different. The aspect of creativeness also must be supposed to be different in an unlimited Being from what it is in a finite centre, where it has a temporal beginning and end. It may be possible to meet this difficulty by the supposition of another dimension transcending time in a sense somewhat similar to that in which time may be said to transcend space; but what the precise nature of such a dimension would be, it seems clearly to be impossible for us even to conjecture. Such a supposition, however, need not be supposed to involve the unreality of time, any more than the admission of time involves the unreality of space. The reality that is to be ascribed to time and space is a limited reality. Perhaps it may be better to say that they have only a degree of reality, though the term 'degree' seems to me misleading in such a

reference. Whatever terms we may use, it seems clear that we have to admit an ultimate incomprehensibility. This may be somewhat disheartening, but surely it is not surprising. What it seems important to bear in mind is that such an ultimate incomprehensibility need not interfere with our understanding of what takes place within the spatio-temporal system. Nor need it prevent us from forming hypotheses that help us in some degree to transcend the limitations of that system. We may even hope that it may be possible in time for us to gain a clearer conception than has yet been formed of the direction in which we may profitably look for a more complete interpretation of the higher realities that are at present inaccessible to us. We are limited, but we need not be supposed to be confined within impenetrable barriers. As we are in the region of conjecture, it may be open to us to suppose that the Finite Centre which I have been led to postulate as the source of our spatio-temporal system may comprehend what is for us incomprehensible; and even that we, or what in us may possibly return into that Centre, may also in the end attain to some comprehension of it. But to suppose this is only to raise fresh problems that would have to be dealt with in a separate paper.

IV.—DISCUSSIONS.

THE LADD-FRANKLIN FORMULA IN LOGIC: THE ANTILOGISM.

COMMON Logic[1] has remained practically in the primitive condition in which Aristotle left it for many generations of men. Of the *eight* totally different statements that can be made in terms of the *is*-relation, only four have ever been discovered by it—the well-known *a*, *e*, *i*, and *o*. But there are four other forms of speech that are exactly as well-known in real life, but which Common Logic has never noticed. No human being would experience any difficulty in deciding upon the validity of such a syllogism as this: If none but the brave deserve the fair, and none but soldiers are brave, then none but soldiers deserve the fair. Or this: If none but the brave deserve the fair, and none but those who deserve the fair are happy, then none but the brave are happy.

No scheme in logic that has ever been proposed is more beautiful than that based upon the eight propositions of Dr. Ladd-Franklin.[2] In the opinion of the present writer, they should have long superseded the four propositions of Common Logic. It is the object of this paper to make a brief exposition of this beautiful scheme, and to show that the Syllogism, in its various moods, is reducible to a single symmetrical formula—what Dr. Ladd-Franklin calls the Antilogism.

Dr. Ladd-Franklin uses eight symbols for the eight different propositions. These make four pairs, each consisting of a *universal* and a *particular* which are reciprocal negatives.

[1] I use the term Common Logic, following the good precedent of Alfred Sidgwick, in the derogatory sense.

[2] *Studies in Logic.* By Members of the Johns Hopkins University, 1883. Boston, Little Brown & Co. Review by J. Venn in MIND, 1883, **8**: 594-603.

Dictionary of Philosophy and Psychology, articles on "Proposition," "Syllogism," "Symbolic Logic".

"On Some Characteristics of Symbolic Logic," *American Journal of Psychology*, 1889, **2**: 543-567.

"Some Proposed Reforms in Common Logic," MIND, 1890, **15**: 75-85.

They are :—

I.
$$\begin{cases} a. & p \bigvee q. & \text{No } p \text{ is } q. \\ b. & p \bigvee\!\!\!\!\bigvee q. & \text{All but } p \text{ is } q. \\ c. & p \leqslant q. & \text{All } p \text{ is } q. \\ d. & p < q. & \text{None but } p \text{ is } q. \\ \alpha. & p \bigvee q. & \text{Some } p \text{ is } q. \\ \beta. & p \bigvee\!\!\!\!\bigvee q. & \text{Not all but } p \text{ is } q. \\ \gamma. & p \leqslant q. & \text{Not all } p \text{ is } q. \\ \delta. & p < q. & \text{Some besides } p \text{ is } q. \end{cases}$$

It will be noticed that we begin this "complete scheme" of propositions with "no p is q". It is plain that a and b, a and β, are the good, symmetrical, forms of expression, and that they should always be used by preference in common speech as well as in Symbol Logic. But c and d, γ and δ, are the bad, non-symmetrical, forms and should be as far as possible avoided, in spite of the fact that in real life (and in Common Logic) great precedence has been given to them. It is well known that the only error in reasoning that people are in constant danger of committing is to think that a "wrong conversion" is legitimate. But what does the wrong conversion become if you are speaking in terms of "no p is q"? Instead of inferring from "all p is non-q" to "all non-q is p" (which is dangerously easy), you would have to infer from "no p is q" to "no non-q is non-p," an inference that no one could possibly be tempted to make.

In Ladd-Franklin's system of logic, it must be understood, a term represents any concept, which may happen to be an object, an aggregate of objects (a class), a quality (an attribute), a congeries of qualities, or a proposition. The use of the copula "is"[1] in the verbal translation of the symbols must not be taken as an indication that they can only apply to a logic of extension. The distinction between extension and intension is a matter of psychology rather than of logic. The value of the symbol in logic lies precisely in the fact that it transcends the limitations of ordinary language and ignores rhetorical and psychological distinctions of no logical import. Each of the above eight symbols may of course be rendered in a great variety of ways. A few of the alternatives for reading the proposition "$p \leqslant q$," for example, are: "p is subsumed under q," "p entails q," "p is a sufficient condition for q," "if p is true,

[1] It is rather convenient to have the word "copula" for the "is" of the Logicians—as Lewis Carroll calls them—in "A is B," where it is not specified whether *all* A or *some* A is meant. Dr. Ladd-Franklin has therefore introduced the term "*figured* copula" to denote that kind of copula which carries within itself an indication of both the "quality" and "quantity" of the proposition expressed—the copulæ, namely, of Table I. Within a single article, however, it will not result in ambiguity if we use the plain word "copula" in this latter signification.

then q is true". I would also read it "p implies q" were it not for the fact that that word has already been used in a system (that of Whitehead and Russell) involving a number of anomalies with which the present one is not affected.[1]

Certain properties and relations of the eight symbols are highly significant and should be pointed out. (1) A *universal* proposition is expressed with a symbol of an odd number (three) of lines, a *particular* with an even number (two or four) of lines. (2) A pair of propositions that are negatives of each other can at once be recognised by the presence or absence of the horizontal line on top of the symbol. (3) Symmetry, or its absence, in the symbol indicates whether the relation it represents is symmetrical, or not. (4) Simple rules correlating rotation of the symbol or movement of its horizontal line with change of sign of the terms can be readily formulated so that all the four *universal* propositions, and the four *particular* propositions as well, are convertible each into every one of the others. Thus when any of the four pairs is taken as a primitive, the other three are immediately definable. The following table gives the equivalent expressions :—

$$\text{II.}\begin{cases} a. & (p \overline{\vee} q) \equiv (\bar{p} \Vdash \bar{q}) \equiv (p \leqslant \bar{q}) \equiv (\bar{p} \overline{\leqslant} q) \\ b. & (p \Vdash q) \equiv (\bar{p} \leqslant q) \equiv (p \overline{\leqslant} \bar{q}) \equiv (\bar{p} \overline{\vee} \bar{q}) \\ c. & (p \leqslant q) \equiv (\bar{p} \overline{<} \bar{q}) \equiv (p \overline{\vee} \bar{q}) \equiv (\bar{p} \Vdash q) \\ d. & (p \overline{<} q) \equiv (\bar{p} \overline{\vee} q) \equiv (p \Vdash \bar{q}) \equiv (\bar{p} \leqslant \bar{q}) \\ \alpha. & (p \vee q) \equiv (\bar{p} \overline{\Vdash} \bar{q}) \equiv (p \overline{\leqslant} \bar{q}) \equiv (\bar{p} < q) \\ \beta. & (p \overline{\Vdash} q) \equiv (\bar{p} \leqslant q) \equiv (p < \bar{q}) \equiv (\bar{p} \vee \bar{q}) \\ \gamma. & (p \overline{\leqslant} q) \equiv (\bar{p} < \bar{q}) \equiv (p \vee \bar{q}) \equiv (\bar{p} \overline{\Vdash} q) \\ \delta. & (p < q) \equiv (\bar{p} \vee q) \equiv (p \overline{\Vdash} \bar{q}) \equiv (\bar{p} \leqslant \bar{q}) \end{cases}$$

The formulæ for transposition are also simple. Here we must introduce the two existence terms, ∞ and 0. The term ∞ is definable as $x + \bar{x}$ and means things which exist—not "everything which exists"—and the term 0 is definable as $x\bar{x}$ and means non-existent things. In the compound proposition, *i.e.*, in the proposi-

[1] Logic should be developed in the first instance on the general supposition that propositions are sometimes true and sometimes false. "Sometimes it is true (in some laboratories, in some seasons, in some climates) that acid things are all blue and sometimes it is false." "Sometimes my cherries are ripe before my strawberries and sometimes the reverse is the case." Later the necessary restrictions will be introduced for the case in which none but the always true or the always false propositions are considered. However, the special case of the *term* which includes everything and the term which is non-existent exactly parallels this case: for those who believe in the non-existence of mind (as the Behaviorists) "everything is matter". See my discussion of this question recorded by Schroeder in his *Algebra der Logik*, ii., 465-492, "Meine Kontroverse mit Frau Franklin-Ladd". C. I. Lewis (*A Survey of Symbolic Logic*, p. 224) has furnished a good name, the Two-Valued Algebra of Logic for this branch of the subject.—C. L. F.

tion the elements of which are themselves propositions, ∞ means logical possibilities and 0 means logical impossibilities. With the use of these two existence terms, a proposition in any symbol has four different forms :—

III.
$$\begin{cases}
a. & (p \overline{\vee} q) \equiv (q \overline{\vee} p) \equiv (pq \quad \overline{\vee} \infty) \equiv (\infty \quad \overline{\vee} \quad pq) \\
b. & (p \barwedge q) \equiv (q \barwedge p) \equiv (p + q \barwedge 0) \equiv (0 \barwedge p + q) \\
c. & (p \leqslant q) \equiv (\bar{q} \leqslant \bar{p}) \equiv (p\bar{q} \quad \leqslant 0) \equiv (\infty \leqslant \bar{p} + q) \\
d. & (p < q) \equiv (\bar{q} < \bar{p}) \equiv (p + \bar{q} < \infty) \equiv (0 < \quad \bar{p}q) \\
\alpha. & (p \vee q) \equiv (q \vee p) \equiv (pq \quad \vee \infty) \equiv (\infty \vee \quad pq) \\
\beta. & (p \barvee q) \equiv (q \barvee p) \equiv (p + q \barvee 0) \equiv (0 \barvee p + q) \\
\gamma. & (p \overline{\leqslant} q) \equiv (\bar{q} \overline{\leqslant} \bar{p}) \equiv (p\bar{q} \quad \overline{\leqslant} 0) \equiv (\infty \overline{\leqslant} \bar{p} + q) \\
\delta. & (p \overline{<} q) \equiv (\bar{q} \overline{<} \bar{p}) \equiv (p + \bar{q} \overline{<} \infty) \equiv (0 \overline{<} \quad \bar{p}q)
\end{cases}$$

Since a proposition can be expressed in any one of the four symbols, and there are four equivalent forms with each symbol, one can write the same proposition in sixteen different ways. But the eight propositions (designated a, b, c, d, α, β, γ, δ) are all distinct. They form four pairs ($a\alpha$, $b\beta$, $c\gamma$, $d\delta$), which jointly exhaust all the possible logical relations between two terms, while the members of each pair, being reciprocal negatives, are mutually exclusive. One proposition from each pair is necessary and sufficient for a complete knowledge of the relations between two terms, and there are sixteen possible combinations. A single proposition may then be said to give us information regarding the relation between two terms with three degrees of ambiguity, or to stipulate a condition with three degrees of freedom.

Apart from such immediate inferences as are represented by simple "transformations" (change of copula in Table II and transposition in Table III), all forms of deductive reasoning make use of analysis and recombination of propositions. The following formulæ show how certain sets of simple propositions combine to make compound propositions :—

IV.
$$\begin{cases}
a. & (p + q \overline{\vee} r + s) \equiv (p \overline{\vee} r) \quad (p \overline{\vee} s) \quad (q \overline{\vee} r) \quad (q \overline{\vee} s) \\
b. & (pq \quad \barwedge \quad rs) \equiv (p \barwedge r) \quad (p \barwedge s) \quad (q \barwedge r) \quad (q \barwedge s) \\
c. & (p + q \leqslant \quad sr) \equiv (p \leqslant r) \quad (p \leqslant s) \quad (q \leqslant r) \quad (q \leqslant s) \\
d. & (pq \quad \overline{<} r + s) \equiv (p \overline{<} r) \quad (p \overline{<} s) \quad (q \overline{<} r) \quad (q \overline{<} s) \\
\alpha. & (p + q \vee r + s) \equiv (p \vee r) + (p \vee s) + (q \vee r) + (q \vee s) \\
\beta. & (pq \quad \barvee \quad rs) \equiv (p \barvee r) + (p \barvee s) + (q \barvee r) + (q \barvee s) \\
\gamma. & (p + q \overline{\leqslant} \quad rs) \equiv (p \overline{\leqslant} r) + (p \overline{\leqslant} s) + (q \overline{\leqslant} r) + (q \overline{\leqslant} s) \\
\delta. & (pq \quad < r + s) \equiv (p < r) + (p < s) + (q < r) + (q < s)
\end{cases}$$

More often than not certain component propositions are discarded during the process of reasoning. Such deductions constitute an "understatement" of the matter given; they contain less

information than is given in the premises. The Syllogism itself is an example of this: its conclusion contains exactly half of the matter contained in the premises. Formulæ for "understatement" are deducible from those in Table IV, but they are most serviceable in the following forms:—

V.
$$\begin{cases} \alpha. & \text{From } p \overline{\vee} q, \text{ one obtains} & pr.. \overline{\vee} qs.. \\ \beta. & ,, \quad p \overline{\Vee} q, \quad ,, \quad ,, & p+r+.. \overline{\Vee} q+s+.. \\ \gamma. & ,, \quad p \leqslant q, \quad ,, \quad ,, & pr.. \leqslant q+s+.. \\ \delta. & ,, \quad p < q, \quad ,, \quad ,, & p+r+.. < qs.. \\ \alpha. & ,, \quad p \vee q, \quad ,, \quad ,, & p+r+.. \vee q+s+.. \\ \beta. & ,, \quad p \overline{\Vee} q, \quad ,, \quad ,, & pr.. \overline{\Vee} qs.. \\ \gamma. & ,, \quad p \leqslant q, \quad ,, \quad ,, & p+r+.. \leqslant qs.. \\ \delta. & ,, \quad p < q, \quad ,, \quad ,, & pr.. < q+s+.. \end{cases}$$

In the foregoing brief exposition I have made no attempt at enumerating *primitives* and deriving (defining or proving) other concepts and other principles. There are a variety of alternative starting-points, but a systematization can be achieved without much difficulty.

That Common Logic is extraordinarily restricted will already have been obvious. The Syllogism is, of course, a *special* form of reasoning, but the usual treatment is much less general than it might have been. It regards subject and predicate as inseparable and non-transposable, and further fails to make full use of negative copulæ and negative terms. The various *moods* arise in this way, and rules are specific rather than general. By means of simple transformations (as shown in Tables II and III), all valid moods of the Syllogism are reducible to, or deducible from, the one single formula of the Antilogism.

Whereas the Syllogism states that the two premises are sufficient for the conclusion ($p_1\ p_2 \leqslant c$), the Antilogism says that the two premises are incompatible with the negative of the conclusion ($p_1p_2 \vee \bar{c}$, $p_2p_1\bar{c} \vee \infty$, etc.). The general formula of the Antilogism is:

$$\begin{aligned} & (a \overline{\vee} b)(\bar{b} \overline{\vee} c) \overline{\vee} (a \vee c) \\ \text{or} \quad & (a \overline{\vee} b) \overline{\vee} (\bar{b} \overline{\vee} c)(a \vee c) \\ \text{or} \quad & (a \overline{\vee} b)(\bar{b} \overline{\vee} c)(a \vee c) \vee \infty \\ \text{or} \quad & \infty \overline{\vee} (a \overline{\vee} b)(\bar{b} \overline{\vee} c)(a \vee c)^{1} \end{aligned}$$

[1] One may also put it in the form "$\bar{p}_1 + \bar{p}_2 \Vee c$," which may be read: "Unless at least one of the two premises is rejected, the conclusion is inevitable". A general formula in terms of $\Vee$ and $\overline{\Vee}$ will then be in the form

$$(a \overline{\Vee} b) + (\bar{b} \overline{\Vee} c) \Vee (a \Vee c)$$

or its equivalents derivable by transposition.

Three simple rules are sufficient to insure the validity of the Antilogism: (1) Any two propositions have one term the same and one term different. (2) One and only one proposition is *particular*. (3) A term that appears in the *particular* proposition has the same sign in a *universal* proposition; a term that appears in both *universal* propositions has opposite signs.

The derivation of the formula is very simple. From $(a \bigvee b)$ and $(\bar{b} \bigvee c)$ we obtain as "understatements" $(ac \bigvee b)$ and $(\bar{b} \bigvee ac)$. These combine into $(ac \bigvee \infty)$ or $(a \bigvee c)$, which is by definition the negative of $(a \bigvee c)$. Hence $(a \bigvee b)(\bar{b} \bigvee c) \bigvee (a \bigvee c)$.

To reduce the Syllogism in its heterogeneous moods into one single formula of the Antilogism, it is only necessary to change all *universal* propositions into the form "no p is q" and all *particular* propositions into the form "some p is q," and deny the conclusion. Eugen Mueller[1] gives a transformation of all the valid moods of the Syllogism into what was first called by him "die Ladd-Franklin'sche Formel". He has as the intermediate stage two general formulæ (still syllogisms) equivalent to the following:—

$$\begin{aligned}(a \bigvee b)(\bar{b} \bigvee c) &\leqslant (a \bigvee c)\\ (a \bigvee c)(c \bigvee \bar{b}) &\leqslant (a \bigvee b)\end{aligned} \qquad (n)$$

Since each simple proposition can be expressed in sixteen different ways (as shown in Tables II and III), a combination of three propositions can be expressed in $16 \times 16 \times 16 = 4096$ forms. These two formulæ thus give twice 4096, or 8192, valid forms of the Syllogism. To give separate rules for validity in all these 8192 different forms would be a quite impossible task. But it becomes very simple when the symmetrical $\bigvee$ and $\bigvee$ are used as the standard copulæ.

As long as the essential characteristic of the Syllogism is retained, namely, the distinction between the premises and the conclusion, no further reduction than that given in the formulæ (n) is possible. But when this restriction is removed, we have simply to take the negative of the conclusion and to change the copulæ from $\leqslant$ to $\bigvee$ to have an Antilogism—and *exactly the same* Antilogism in both cases. There is only one Antilogism when once it has been expressed in the "canonical form"—that is, with every universal proposition beginning with "no" and every particular proposition beginning with "some". Then we need only to remember one single rule to test its validity: A term which appears in both universal propositions must have *opposite* signs, a term which appears in a universal and a particular must have the *same* sign in both. That great bugbear of the logicians, distributed and non-distributed terms, does not exist in the logic of the Antilogism, for the reason that the situation is very simple: in the two

[1] *Das Eliminationsproblem und die Syllogistik*, pp. 21-22. Leipzig: Teubner, 1901.

universal propositions all terms are distributed and in the particular proposition both terms are undistributed.

The advantage of the Antilogism over the Syllogism lies in its uniformity, which is due to the symmetry of the (figured) copulæ both within the several propositions and between them. A simple example of the Antilogism can be given in terms of those precious letters of the Logician, *s*, *m*, and *p*:

$$(s \overline{\vee} \overline{m})(p \overline{\vee} m) \overline{\vee} (p \vee s).$$

"If no saints are non-martyrs, and no priests are martyrs, *it is impossible that* any saints should be priests."

To the Common Logician, the Antilogism may appear less familiar than the Syllogism. But this is no indication that our reasoning is carried on more often in syllogistic than in antilogistic form. The Antilogism is the argument of discussion—of rebuttal —*τέχνη ἀντιλογική*. There is reason to think that it arose before the Syllogism. That it can be used at a very early age is proved by the reasoning of a little girl of four (an actual case) who was making the interesting experiment of eating her soup with a fork. "Nobody eats soup with a fork, Emily," her mother said to her. "But I do, and I am somebody," Emily immediately replied. Letting "*s*" represent those who eat soup with a fork, we have this Antilogism in the following symbols:—

$$(s \overline{\vee} \infty) \overline{\vee} (\mathrm{I} \overline{\vee} \bar{s})(\mathrm{I} \vee \infty).$$

Not only is this argument an Antilogism, but it also contains an existence term—a thing quite unknown to the ordinary logician.

The Antilogism was at first called by Dr. Ladd-Franklin the "inconsistent triad"; apropos of it the late Professor Josiah Royce of Harvard was in the habit of saying to his classes: "There is no reason why this should not be accepted as the definitive solution of the problem of the reduction of syllogisms. It is rather remarkable that the crowning activity in a field worked over since the days of Aristotle should be the achievement of an American woman."

EUGENE SHEN,
Columbia University.

"LITERAL TRUTH."

In the course of the dispute about propositions and judgments, in recent numbers of Mind, Mr. Anderson recognises[1] that statements are sometimes misunderstood; and like everyone else he also recognises that they are often understood. But in contrast to Dr. Schiller he seems to trace these different occurrences to some difference of quality in the *literal* statement, independently of the persons who use or interpret them on particular occasions.

But then what are we to make of the case where Brown raises no difficulty about understanding a statement made by Jones, while Robinson discovers an ambiguity in it? The statement is "literally" the same, but the interpretations differ. Brown, let us suppose, simply accepts (or rejects) Jones's statement that every M is P, while Robinson finds that he cannot decide whether this statement makes a true or a false assertion until he knows more clearly what it is intended to mean—*i.e.*, what particular cases Jones here includes under the broad description M. Robinson's difficulty arises out of his belief—mistaken or not—that in one possible meaning of the word M it is false that every M is P, while in another possible meaning of the word he could accept the assertion as true. He cannot get on with the business of accepting or rejecting the matter of fact asserted unless Jones will go behind the literal statement and explain more clearly what he supposes the matter of fact to be. The ambiguous *statement* hides from Robinson the *assertion* which Jones has intended to make.

The same applies of course equally to a statement in the form 'S is M'. S may be M in one sense and not in another; and Brown may be ignorant of the fact, or forget it. Robinson, more anxious or more knowing, hates being entrapped into a false admission, however innocently. He will probably be regarded by careless assertors as a public nuisance, but his request for explanation has occasionally something in it.

These considerations seem partly to account for Dr. Schiller's view of the difference between propositions and judgments. At any rate they are relevant to the question whether a distinction between statement and assertion is worth making and how it should be used. We can accept or reject an assertion when we know what it is, but a statement which is found ambiguous cannot be either accepted or

[1] No. 140, p. 468.

rejected so long as the ambiguity remains. While it is in that condition the rules of contradictory opposition cannot be applied to it by the person who has found the ambiguity.

The discovery of an ambiguity, however, is not the only cause of difficulty in understanding a statement. Failure to see the ambiguity is, on occasion, an equally potent cause. Thus when Robinson draws a distinction—*e.g.*, between proposition and judgment—and Brown is accustomed to use the two words as synonymous, Brown sometimes fails to understand a statement of Robinson's in which one of the words occurs. Substitute the name Bradley for Brown, and Mill for Robinson, and an instance lies to hand in Bradley's *Principles of Logic* (1883), p. 145. Mill having noticed that a 'proposition' can exist without a meaning, Bradley curtly dismisses this as "an unmeaning possibility" on the ground that "a proposition that has no meaning is no proposition".

But Brown's misunderstandings due to confusion of different meanings in a single word are often subtler and more excusable than this. The logic which allows the possibility of a distinction between M and M cannot appeal to Brown so long as he assumes that M must have only one "correct" meaning (when the dictionary treats it as univocal). The whole notion that meaning is relative first to the person who tries to assert, and secondly to his audience, is foreign to him. He is accustomed to think of words and statements as having meanings which belong to them of right, independently of the persons who use and interpret them. Consequently the suggestion that a statement can at the same time have and not have a meaning is to him sheer nonsense. In his view the statement that every M is P (or that S is M) is either literally true or literally false, and there is an end of the matter.

This well-established manner of thinking of statements is natural to common sense and has been imported thence into the traditional logic. If it were totally absurd its misleading power would be more easily seen and defeated. For many everyday purposes it serves sufficiently well; correct and incorrect expressions are frequently met with. A certain small amount of individual irregularity in the use of words is usually allowed by common sense, or at any rate can hardly be prevented; but we all admit that language cannot be left entirely free from obedience to general custom. That way would lie chaos, and chaos in the use of words no kind of logic could allow.

Robinson would, I expect, explain that his view need not imply that "correct" meanings have no existence, but only that they have a limited value. He would remind us that meanings hitherto correct are open to further correction as our knowledge of matters of fact expands. A new discovery of fact may make them clumsy and ambiguous. If knowledge could ever become complete, or even if all mankind could be content to make no new discoveries, all would be well with the theory that statements, as such, have a clearly recognisable meaning of their own; and then inquiries into

a statement's meaning would always be due to mere ignorance, and not forced upon us by the growth of knowledge. But as things are we have to reckon with discoveries which show the need of a distinction between M and M.

Robinson would also probably agree with Schiller[1] that it might be advisable to scrap the word 'proposition' altogether. Since this word has long been applied indifferently both to the sentence expressing the judgment and to the judgment which the sentence expresses, the distinction between statement and assertion might have a better chance of being understood and remembered. If Mill, for instance, in the passage referred to above, had said that a *statement* can exist without a meaning Bradley might have escaped making his unintelligent objection. He might have seen the silliness of supposing that Mill meant to say that an *assertion*, as well as a statement, could be devoid of meaning, since the contrast depends on viewing the assertion as itself the meaning which the statement tries to express. This form of the distinction would also help us to see that stages in the preliminary process of arriving at the judgment have nothing to do with the matter. When a judgment has got so far as to be asserted we can (for the time) take it as complete. A judgment too incomplete to be stated would hardly be open to critical attack.

"Literal truth" is perhaps another expression that might with advantage be scrapped, in logic at least. Like the notion of correct meanings it has some value for common rough purposes. The contrasts it points to are such as that between literal and metaphorical truth, or between exact and approximate truth—contrasts which are sharp enough only for ordinary slack usage. It is difficult to see how the expression could have any value in logic except on the assumption, here combated, that statements always carry their own interpretation on their face for all educated people, while the uneducated can arrive at it by the use of a dictionary or a text-book. We may avoid solecisms through knowledge of the accepted customs of language, but the pervasive risk of ambiguity due to the real need of distinguishing between M and M *in particular contexts* cannot be so easily escaped.

[1] MIND, No. 139, p. 339.

ALFRED SIDGWICK.

THE TWO LOGICS.

I MUST once more express gratitude to Mr. Anderson for the very full reply he has vouchsafed to my paper in No. 139. I have found it very instructive, but the very thoroughness and wealth of detail which distinguish his remarks tend perhaps to obscure the larger issues, *viz.*—Is there really any agreement among logicians as to the nature of Logic?—and if not, How many logics is it incumbent on us to recognise as existing *de facto?* Now on these issues I have a very easy case to defend: I answer *No* to the first question, and *Two* to the second. And so it is evident that, to prove my case, all I have to do is to stand firm in my own position, and to persist in disagreeing with Mr. Anderson!

I do not however propose to take unfair advantage of this controversial position, and prefer to give Mr. Anderson every opportunity of confuting my contention, by agreeing with me. And this, after all, he should not find so very hard; for I ask him, not to adopt my logic, but only to admit that it differs radically from his, and that it is futile to slur over their divergence by using ambiguous terms. I shall proceed to illustrate some of their differences.

(1) *Truth*, to me, means a form of value which it is easy to claim, but hard to substantiate, and impossible to establish absolutely and for ever. It is always *good to believe* the *best* that can be believed at the time, and makes this claim, not only for the individual who announces it, but also for all to whom it is addressed. Thus it is possible to distinguish between the logical and the psychological aspect of a truth-claim. No 'truth' however is so good that science need despair of bettering it, and the belief of many dogmatic souls, that they are in possession of 'absolute' truths that cannot be improved, proves nothing. In view of the history of all our 'truths' it must be accounted a psychological delusion. It is easy to *claim* truth, because in words every judgment makes a formal truth-claim; this however proves nothing, because *false* judgments also make this same claim, and because the verbal form as such does not enable us to determine how much belief supports the judgment. The most hesitant and reluctant choice of what seems on the whole the better of two unpalatable alternatives, and the most confident and unreflective of affirmations find expression in the same form. Hence it is always legitimate to go behind the verbal form of the 'proposition,' and to go into the meaning and state of mind of the man who used it. However, in a real inquiry (into the logic of which Formal Logic refuses to enter!) we are *never* concerned with

this formal truth-claim embodied in language. For, being common to true judgments and false, it can be taken for granted. Real inquiry therefore takes 'truth' as something which *excludes* falsity, and sets itself to *test* truth-claims. This notion of truth is evidently nothing, if not critical of truth-claims.

To Mr. Anderson, on the other hand, truth is not an affair of human values at all. Truth is essentially 'independent' of us ("it is a question . . . of *the claim of independent truth* which we make whenever we . . . assert anything at all," p. 466). It is "something which actually occurs" (p. 467) or "has occurred" (pp. 467 and 470, *passim*). It is "a matter of fact" ("if there is such a thing as a matter of fact, surely that and that only is what we mean by truth," p. 470), and perhaps even a 'thing' ("unless we can speak of *things* independently . . . we cannot make intelligible statements at all," p. 471). It becomes 'absolute,' if and when we definitely believe it ("this 'absolute truth' is, of course, just the truth that we claim for what we definitely believe," p. 467).

The politest thing I can say about these doctrines is that they are very different from mine. They seem to me a trifle uncritical, and if I had to criticise (as, happily, I am not bound to do), I should add in the first place that they do not seem to be doctrines consonant with the best linguistic usage. Accurate usage distinguishes between 'matters of fact' and the truth *about* them, and implies that any *assertion* about a matter of fact must be a *matter of opinion*. So that Mr. Anderson's doctrine reduces itself, after all, to a form of the 'correspondence' theory. Secondly, it seems strangely incongruous, first to make truth independent and a matter of fact, and then to make its absoluteness depend on what we can 'definitely believe'. For *belief* is something subjective and psychological, and plainly admits of *degrees*. Yet Mr. Anderson repudiates degrees of truth (p. 472), though how he deduces this from the nature of belief I have not been able to make out.[1]

(2) *Judgment*, to me, means essentially a personal act of a knowing subject who feels himself prompted by his actual situation to deliberate and to decide between (*at least logical*) alternatives, before he acts. Thus every judgment takes place in a psychical setting which always includes the whole previous history of the judger: but it does *not* include the antecedents commonly called 'logical' (such as whether the judgment is a 'valid inference'), unless he was himself aware of them. Logic however can usually disregard this psychical setting, though it must be ready to consider it whenever relevance is claimed for it. For it is usually enough to consider merely whether the judgment made was the *best* that could have been made under the circumstances (which include, of course, the circumstances of the *judging*). If it was, it was a *good*

[1] Neither do I feel sure whether Mr. Anderson does not go further and make even 'matters of fact' depend on belief: does "there are certain things we believe and, in so doing, regard as matters of fact" (p. 467) mean that belief creates matters of fact?

judgment, the *right* judgment to make, and 'objectively valid,' *i.e.* incumbent on all so situated. It is evident that about judgment so conceived both logical and psychological questions may be raised: but they are quite distinct, and questions about the *value* (truth or falsity) of the judgment are not concerned with the judging, conceived as a mere psychical event.

What seems to me the responsible act of a judger who lays claim to logical Value (truth) is stripped by Mr. Anderson of logical significance and reduced to a merely psychological process. For him Judgment means 'what is judged' ("judgment is taken to mean *what is judged*," p. 466, "when we speak of judgment in the sense of what is judged, we are speaking about a proposition," p. 468); and it should be denied that there is any distinction between judgments and propositions ("I should deny that there is any distinction between judgments and propositions," p. 466).

Does not this account for my complaint that in Formal Logic no proper *distinction* is made between judgments and propositions? Does it not even make it plausible? Does it not cut out the properly logical problem altogether? For it leaves no conceivable subject of logical inquiry between the process of judging and the matter of fact judged about, and the former would seem to be psychological while the latter is metaphysical (ontological). And I cannot see that this procedure is in any way necessary or advantageous to Logic.

(3) A *Proposition*, to me, is just a form of words in which meaning has been expressed, and which may be used again to convey *similar* meanings. It can do this because, by use, words come to acquire verbal meaning: *i.e.* they become permanently capable of reminding us of the meanings they have been used to convey. That the *future* meanings of a proposition will be consonant with its past is, however, only an expectation and a probability. It is not a condition of its use or usefulness. That a proposition should have *only one* meaning, and that it should be tied down to that, is, strictly, impossible. It is to demand a language composed entirely of ἅπαξ λεγόμενα. It is also undesirable, because it would preclude learning and the growth of knowledge. But the *plurality* and *plasticity* of meanings which are essential to the usefulness of words, and need be no serious bar to understanding, should be carefully distinguished from the *ambiguity* with which Formal Logic (and, I am afraid, Mr. Anderson) confuses it.

As regards the 'truth' of propositions it is to me potential and not actual. It is impossible to infer future truth from past, simply because one cannot *foresee* future uses, and in its next context the proposition may become false. Thus it does not follow that because '*it is hot*' was true in July, it will be true in January. Even the 'eternal truths' of arithmetic do not conserve their truth in their applications; '2 + 2 = 4' will fail to hold, if we choose to apply it to drops of water. I hope these easy illustrations may enable Mr. Anderson to understand what I said on p. 339, and he

disputed on p. 470. If he does, he should have no difficulty in seeing why I said that to demand of propositions literal truth under all circumstances was a short cut to scepticism.

For Mr. Anderson, on the other hand, propositions must be "capable of being unconditionally true" (p. 472, *s.f.*), and if he cannot get such propositions, he threatens to despair of truth. That would be a pity, but I doubt whether he will do anything so rash when he fails to vindicate the unconditional truth of the propositions just given. He has, after all, the alternative of moderating his impossible demands upon the 'truth' of propositions!

(4) I was very glad to find Mr. Anderson prepared to discuss the question of *Relevance;* for that is one of the major points of difference between the two sorts of Logic. He declares (p. 470) that relevance "has nothing to do with truth; a relevant judgment may be false, an irrelevant one true". Now this is true (in the abstract), but not relevant to the point in dispute. For it is nothing like enough to decide it; and when it is decided, it will be seen that though relevance may have nothing to do with truth in the abstract it has a great deal to do with such truth as is claimed, and tested in an actual context.

To Mr. Anderson's statement two vital additions should be made. (1) A relevant judgment, though false, may be much more *valuable* than a judgment true (in the abstract), but irrelevant to the inquiry. (2) An irrelevant judgment, though 'true,' may be much worse than false. (1) is important because in any inquiry we must first of all delimit the field within which the truth we are seeking may be presumed to lie: otherwise we shall get lost, and never 'get to the point'. So a false, but relevant, judgment may be a real help in the earlier stages of an inquiry. (2) is important because in real inquiry we must not allow the immensity of known truth to distract us from the discovery of unknown truth. And an irrelevant answer to a question is highly distracting. A man who, when he is asked what the time is or what he will have for dinner, habitually replies with selections from the Multiplication Table, will rightly be shut up as a lunatic; for such irrelevance will be held to indicate insanity and to be far worse than error.

The same point may also be illustrated by the example about the colour of the penny stamp. If this arose in a real inquiry, say into the colour vision of one who could see no difference in colour between a penny stamp and a halfpenny stamp, it would be sufficient (and probably better) to judge that the penny stamp was red: that it was scarlet would be 'true,' but irrelevant *in this context.* But if philatelists were raising a question about the shades of the penny stamp, the judgment *it is scarlet* would become relevant, and would be so much better and more to the point, that anyone who persisted in affirming that *it was red* would be regarded as a fool. For though of course his judgment would still be 'true' (in the abstract), and true enough for *other* purposes, it would *not* suffice for the purpose

in hand. We should hesitate to call it 'true,' in the sense of 'valuable,' and this hesitation would reveal the divergence between the two senses of 'truth.'

The truth is that Formal Logic, by fostering the habit of considering the 'truth' of propositions in the abstract and without regard to their use in an actual context, has engendered a vast amount of obtuseness. So formal logicians can still be found to illustrate 'valid reasoning' by strings of propositions like *All men are mortal, Socrates is a man, ∴ Socrates is mortal,* without noticing or reflecting that Socrates has been dead for over two thousand years, and that it is as 'invalid' as it is silly to call him 'mortal'. For whatever sense they may give to 'mortal,' they cannot give a sense to their 'valid syllogism' without using mortal invalidly in two senses. So as a 'proposition' the inference *Socrates is mortal* is no more 'valid' than *all chessmen are mortal;* only it is not so good a joke!

(5) My dissent from Mr. Anderson's conceptions of selection and reality I need not dwell upon; for it arises on ground which is psychological and metaphysical rather than logical. Mr. Anderson seems to have committed himself to a Humian 'atomism' about the real, and to assume that because the objects we think about *are* distinct, they do not need to be distinguished; whereas I should hold, even if this account were metaphysically correct, it would still be necessary to account for the psychological making of distinctions and for the logical dependence of *our* distinctions on our purposes. Also it seems to me to be pretty plain that however discrete ultimate realities may turn out to be, our experience comes to us as a *continuum*, as a flow of happenings, out of which we have to pick the objects of our attention and interest. This psychological procedure may, of course, be objected to on two metaphysical grounds. On the one hand it may be alleged, as by Bradley, that of necessity it *falsifies*, because the real is so compact a whole that nothing can be picked out of it. On the other hand it may be assumed, as by Mr. Anderson, that the real is so dissociated that no further picking and choosing can be tolerated, and that the distinctions our thought makes must be invalid, if it really *makes* them. But both to Bradley and to Mr. Anderson the same reply must be made. If our thought actually proceeds by making these distinctions, our Logic must sanction them; we cannot allow it to be arbitrarily and gratuitously discredited in deference to such metaphysical prejudices. And, after all, no reason is ever alleged why our logic should *not* recognise our ways of thinking and make the best of them!

F. C. S. SCHILLER.

SOME ÆSTHETIC THEORIES OF MR. RICHARDS.

I SHALL consider in this paper only certain views which I take to belong to æsthetics as distinguished from psychology and philosophy. The discussion will be divided into sections, each of which (except the brief concluding one) will deal with a different thesis maintained by Mr. I. A. Richards in his *Principles of Literary Criticism.*[1]

I.

"The world of poetry is made up of experiences of exactly the same kind as those that come to us in other ways."[2]

So, if we substitute "art" for "poetry," runs one of Mr. Richards' main theses. He supplements it by holding, further, that art can give no experience which differs from any ordinary experience, such as walking to a gallery, in any kind of way other than that in which writing and smoking simultaneously differs from merely writing.

It was time that someone should defend those who fail to feel that pure reaction to significant form and colour so essential—it was urged—to a state of grace. Our reactions to colour, if emotional at all, contain at least some one emotion which is not identical with æsthetic emotion. That some colours make us lively and others depress us is a common-place; but there is considerable need for observation of the different emotions experienced when we like or dislike any colour. And form must abandon its claims for a similar reason.

But, even having reached this conclusion, one can still ask whether there is anything peculiar in æsthetic experience which differentiates it from other emotional experiences as sharply—though not necessarily in the same way—as fear is differentiated from anger. In order to discuss this question I start with the following consideration: the word "beautiful" is very frequently used, and so is the expression "æsthetic experience". What I am going to say is equally true of each, but here I wish to say it only of the latter. I shall also make the supposition that whatever the former means is to be analysed in some way in terms of whatever is meant by the latter. In a vast number of cases the expression "æsthetic experience" does not mean something different every

[1] *Principles of Literary Criticism*, pp. vi + 290, London, Kegan Paul.
[2] P. 78.

time it is used. It does not stand for one experience at one time, and for some other experience at another time, any more than the word "orange" stands for different sense qualities at different times. In the great majority of instances it is used just as "orange" is used, *i.e.* its meaning does not change. *It is the business of the æsthetician to analyse this meaning.* The same problem may be stated in a slightly different way. An investigator must be able to distinguish the phenomena he is investigating from others; and so the æsthetician must be able to distinguish æsthetic experiences from others. An attempt to analyse the meaning of "æsthetic experience" may lead to the discovery that æsthetic experiences differ from a great many others no more radically than the performing of gymnastic exercises differs from walking. It may lead to the discovery that the expression has a wider application than one might suppose. But it is most important that some definite description should be given which both applies to every æsthetic experience and does not apply to anything else.

Mr. Richards does not keep this question clearly before him, but he says a good deal which is relevant to the answering of it. He attempts to explain how the "mistaken" belief in an æsthetic emotion has arisen, and he divides the explanatory features into two classes: (i) those necessary for the communication of æsthetic experience; and (ii) those constitutive of its value. The first class consists, on the one hand, of attempts on the part of the experient to extrude "personal particularities"; and, on the other hand, of the formal elements. Under the former heading come "detachment," "impersonality," and the like, which, as Mr. Richards points out, have often been claimed as distinctive of æsthetic experience, although they belong so conspicuously to scientific research. The latter heading might seem to give a more plausible analysis—namely, that an æsthetic experience is an emotional reaction to some formal element, such as colour, metre, pitch, etc. This, as it stands, is inadequate. But an æsthetic reaction may be *solely* to a formal element, and I find it very difficult to discover any *non*-æsthetic emotional reaction to a formal element of which this is true—the reaction seems always to be partially conditioned by something else, as, for example, a reaction to a red signal lamp regarded as a sign of danger. The definition might, therefore, be amended to run "an æsthetic experience is an emotional reaction to some formal element and to nothing else". But, although this covers certain cases, it is most doubtful whether it is adequate for others. It seems certain that the majority of our æsthetic reactions are partly to non-formal elements.

The second class of explanatory features contains those which Mr. Richards himself, in certain passages,[1] seems to identify with æsthetic experience. They can be summarised as a feeling of harmony, aliveness, and insight due to the co-ordination of a large number of impulses not usually co-ordinated. But here again there

[1] Pp. 16, 78, etc.

are objections. As Mr. Richards admits, the experience of an undreamed-of happiness contains these features: and so we must either admit this to be an æsthetic experience, or declare the description to be inadequate. The former alternative seems to me false. Moreover, the solution of a perplexing problem, whether theoretical or practical, produces the same state of mind as far as these features are concerned. And, in spite of their differences, I can see a similarity between these latter experiences which I cannot see between either of them and æsthetic appreciation. Nor can the difficulty be solved, as Mr. Richards sometimes seems to suggest, by supposing æsthetic experience to contain more co-ordinated impulses than any other experience. Some æsthetic reactions (as, for example, to a patch of colour or even to a simple poem) are obviously less complex than many non-æsthetic reactions.

These are all the suggested analyses which I can gather from Mr. Richards' book. There may be some other analysis introducing no peculiarity; or the definition in terms of formal elements may be correct: but I doubt both these alternatives. How the peculiarity, if such there be, should be described raises another question. It seems probable that it is an emotion: there may be an emotion which is always the experience of several other emotions, and which is the same even if its constituents are different. But I feel extremely doubtful of any suggestion of which I know.

II.

"In a full critical statement . . . the part which describes the value of the experience we shall call the critical part . . . that which describes the object we shall call the technical part."[1] (By "object" Mr. Richards means the external object which causes the experience.)

Questions of the kind treated in this section can be conveniently classified as "Functions of the Critic". Criticism I take to be concerned with four kinds of description. (i) Of the external object: this important work has been neglected; much remains to be done concerning the analysis of the external object, and the correlation of its elements with states of mind. (ii) Of the method by which the experient co-operates with the object to cause his experience. Mr. Richards has done much needed work that comes under this heading—as, for example, his account of the method necessary to obtain a valuable experience of a Cézanne. (iii) Of the experiences caused in the experient. (iv) Of the value of these experiences.

It is necessary to distinguish between experiences and their value. Not all experiences caused by art are valuable, and some are more valuable than others. Therefore the critic must both describe and evaluate. It is these two functions—of description and evaluation—which have been most practised. With regard to

[1] P. 23.

the former, two methods are possible: the scientific and the artistic. The critic may either give a bare analysis, or communicate his own æsthetic experience. It is very important, one would like to add, that the experiences caused by bad art should be described. It is only too fatally easy merely to condemn something as bad and then to neglect it.

I shall now consider briefly Mr. Richards' treatment of the external object. He denudes this as completely as possible: not only is "beautiful" significant *only of experiences*, but also such words as "balance," "design," "unity," "solidity," "plot," etc.[1] He takes this position confidently, but almost without defence. His only attempt at proof is when he says that in the case of poetry there is difficulty in discovering to what other than print and paper these qualities could belong. If an argument is to be based on this, it can only be an argument by analogy in the case of the other arts; but even with regard to poetry its strength is not considerable. We are asked to what such qualities as plot, balance or form could belong. In the first place, they may belong to the seen and the spoken word; and these are far from being obviously mental states. Secondly, there may be meaning, and the qualities may belong to *it*. I do not suppose that every form of words has a fixed meaning correlated with it, but that any one of the meanings which it may have is external to the mind. To defend this position it would be necessary to refute Mr. Richards' theory of universals as developed in *The Meaning of Meaning*.[2] I must here content myself with a final expression of doubt as to whether the external object is as conspicuously nude as Mr. Richard maintains.

III.

"The two pillars upon which a theory of criticism must rest are an account of value and an account of communication."[3]

I shall briefly call attention to a few points with regard to communication, and preface them with the remark that this subject should come under the heading "The Psychology of Æsthetic Experience".

The important distinction which Mr. Richards draws between the two uses of language belongs to this section, for it is equivalent to the distinction between the communication of a judgment and the communication of an experience. "A statement may be used for the sake of the *reference*, true or false, which it causes. This is the *scientific* use of language. But it may also be used for the sake of the effects in emotion and attitude produced by the reference it

[1] Pp. 21-22.
[2] *The Meaning of Meaning*, C. K. Ogden and I. A. Richards, Kegan Paul.
[3] P. 25.

occasions. This is the *emotive* use of language."[1] Poetry, he says later, "is the supreme form of emotive language".[2]

Mr. Richards is most anxious to point out that communication is a very difficult task. This is an obvious but much overlooked fact in the case of experiences; but he does not draw the necessary sharp distinction in this respect between these and judgments. When we reflect, we realise that most recitals of fortunes or misfortunes, in which we are not immediately concerned, leave us comparatively cold. We may murmur "How sad," and feel a faint thrill of sympathy; but it is only on rare occasions, when someone with exceptional gifts comes along, that our emotions are thoroughly aroused.

Mr. Richards enquires what special gifts enable the artist to communicate. The features, which, he thinks, may probably serve this purpose, are those which he identifies with creative imagination; and they will be enumerated in the next section. Mr. Richards considers that it is in connection with this subject that the formal elements have their chief function. He thinks that they have a stronger control than other features over communication because our responses to them are more uniform. I doubt this contention on the ground that he has over-rated the uniformity of these responses. Colour combinations, for example, produce varying effects with varying fashions. Apart from this, the same colour or combination of colours may please me and displease you, may suggest this emotion or that; and rhythm has quite a different effect on the musical mind from that which it has on the unmusical.

IV.

"What is needed is a defensible position for those who believe that the arts are of value"[3]—for that expert who says, in effect, "'I am better than you, my taste is more refined, my nature more cultured, you will do well to become more like me than you are.'"[4]

Mr. Richards states a theory of value for which he claims the merit of involving no unique ethical constituent, and of providing grounds for an evaluation which is not merely the expression of personal preference. The conclusion of the argument is that to be more valuable is to systematise a greater number of impulses. The consideration of this theory belongs to ethics, and I shall only make a few remarks about it. If the proposition is analytic, as I assume, it does not put the expert in a very strong position. Mr. Richards supposes that "apart from consequences, anyone will actually prefer to satisfy a greater number of equal appetencies rather than a less."[5] But he will only want to satisfy those which

[1] P. 267. [2] P. 273. [3] P. 36.
[4] P. 37. [5] P. 47.

he has; and a man who has little of anything may not want more. And even if we confine ourselves to those impulses which he *has*, a man may actually prefer to satisfy only a certain few rather than sacrifice these for a greater number. The expert cannot claim that he and the uninitiated really *want* the same. He can only radically change his ground and make the extremely doubtful claim that a man with his wants is the happier.

Secondly, it has not been actually shown that the arts can satisfy a greater number of impulses than can be satisfied by what Shelley calls the "calculating principle," though it is quite clear that the kinds of impulse satisfied differ very much. It seems to me not only that the number may not be greater, but also that, whether it is or not, our judgments of value concerning the arts should remain the same. I believe that our knowledge of the value of art and of the relative value of works of art is far more certain than the truth of Mr. Richards' principle. But to answer the question why the arts are valuable is a most important æsthetical task; and the answer should consist of a statement of clear points, and not of the all too frequent flow of rhetoric.

Art, according to Mr. Richards, is valuable not because it is a unique experience: its value is moral. Falsely to believe that "to appreciate a work of art we need bring with us nothing from life" is pernicious, because it prevents any investigation into the true value of art. The question to be asked of art is: With what success does it produce experiences of the same kind as those otherwise produced?

Mr. Richards, who, as we have seen, is much struck by the difficulty of communicating experiences, answers, in the first place, that art is almost the only means. As such, I would urge, it both saves us from the horrors of loneliness and gives us a very desirable feeling of kinship with others. Should anyone doubt the first, or under-rate the second, I advise him to study Matthew Arnold and to introspect. But, secondly, as Mr. Richards points out, the experience of the artist is exceptionally valuable, and art is the means of giving us more valuable experiences than we should have without it. What are the features which constitute this value? They are those which Mr. Richards identifies with creative imagination, and, although he repeats them several times, it is none too easy to state them clearly. Perhaps they may be stated as follows: (i) the artist establishes unusual connexions between reactions; (ii) he reacts to a greater number of stimuli, both because he co-ordinates more and discriminates more finely; (iii) he combines exceptional order with exceptional strength of emotion. On these points depend that availability of his experience which gives him special communicative power. When the ordinary man receives the communication, the blinkers which he habitually wears are removed, so that increased co-ordination results; he reacts to objects which formerly left him unresponsive; he is freed from conventional attitudes that blinded him to real

issues; and, finally, he feels "strangely alive" as the recipient of a revelation.

I should like to make three observations on Mr. Richards' evaluation. First, it is a feature of Shelley's praise of poetry that he emphasises its practical value. Mr. Richards, far from denying this value, makes several observations in different parts of the *Principles* which show that he affirms it. But he does not distinguish it in the most relevant places. This may be accounted for by a too frequent reliance on the term "impulse". This term is defined[1] so widely that it covers any mental process whatever; and at times it is used so freely that it impedes discrimination where this is required.

Secondly, I disagree to some extent with Mr. Richards' view of the intellectual factor. I agree that the truth or falsehood of certain propositions is quite irrelevant; that no statement in poetry can be true in a precise sense; that an æsthetic experience must always contain constituents other than beliefs, and that an experience containing false beliefs may be very valuable. But some statements in poetry are much nearer truth in the precise sense than others. They are analysable into a greater number of true propositions, and only need certain qualifications to become true. And many statements, though literally false, are not intended to convey a literal meaning. There are many beliefs, true or false in the sense described above, which, if they are false, cause a defect in the attitude aroused, and, if they are true, constitute an important merit. Among these are ethical judgments. Compare

> "Let others flatter Crime, where it sits throned
> In brief Omnipotence; secure are they:
> For Justice, when triumphant, will weep down
> Pity, not punishment, on her own wrongs,
> Too much avenged by those who err."

And it is sometimes an artistic merit to employ psychological judgments which are true to life.

Thirdly, it is probable that art has a unique value—that there is something peculiar in it (say, æsthetic emotion), and that this is good. This value is additional to those described above. Whether it applies or not is dependent on whether there is anything peculiar to art or not.

V.

My main concluding point will be to recapitulate, with a few explanatory remarks, those headings under which I have supposed that many problems in æsthetics can conveniently be treated. But I shall first call attention to an important problem which Mr. Richards, in common with so many others, has neglected. To me there is no doubt that many things are beautiful which are not

[1] P. 86.

works of art. This fact raises the following two questions: (i) What differentiates æsthetic experiences caused by these from æsthetic experiences caused by works of art? (ii) What difference of value does this differentiation produce?

It is most important that æsthetics should receive as exact a treatment as possible. Mr. Richards has aimed at satisfying this need. To classify one's problems is an essential step. His book has suggested to me certain divisions, which it has by no means consistently followed. These are (i) The Psychology of Æsthetics, which includes such problems as those of the æsthetic emotion, of communication, of imagination; (ii) The Functions of Criticism; (iii) Questions concerning Æsthetic Value. In insisting on the necessity of systematically following some such procedure, I am only insisting on the necessity of method.

E. HELEN KNIGHT.

V.—CRITICAL NOTICES.

Behaviorism. By JOHN B. WATSON. London: Kegan Paul, Trench, Trubner & Co. Ltd., 1925. Pp. 251. Price 12s. 6d. net.

THIS is the third book in a declining series. In 1914 Watson published the volume entitled *Behaviour: an Introduction to Comparative Psychology.* It was an admirable treatise, clear, concise and original. It marked a definite break from the old, anecdotal mode of the study of animal behaviour, when animals were supposed to be of interest only in so far as their conduct appeared to approximate to that of man. In this book Watson even displayed definite traces of cautiousness; I suppose it was because he was as yet quite young. Five years later appeared *Psychology from the Standpoint of a Behaviorist.* This book was distinctly inferior to the first. Watson was now much less interested in elaborating a method of study and in discussing his results in relation to the method, than in somewhat dogmatic assertions of the adequacy of the method and the significance of the results for the whole field of human psychology. Caution began to go to the winds. Still the book, though highly provocative and biassed, was a serious contribution, and, in spite of a load of detail, was comprehensible and vigorous.

Now comes *Behaviorism.* It signalises a great fall. The last remnants of caution have disappeared, as if the writer is getting old. Watson comes before the public as an extraordinary blend of popular lecturer, laudator of "science," prophet, vivid controversialist, staid experimenter, wild theoretician and, the rôle which he seems to enjoy most of all, *l'enfant terrible.* He is popular lecturer on every page of this book, always on the look-out to tame the leviathan of public opinion with a joke, and extremely clever at the job. He is praiser of "science" whenever he wants to get Behaviourism out of an awkward difficulty. He is prophet constantly, as when, on the seventeenth page, he is sure that what unimportant fragments of introspective and functional psychology, of philosophy, ethics, social psychology, sociology, religion, and psycho-analysis yet appear to remain will speedily be swallowed up by the voracious behaviourist. He revels in vivid controversy: "Most of you are familiar with William James' classic chapter on the stream of consciousness. We have all loved that chapter. To-day it seems as much out of touch with modern psychology as the stage coach would be with modern New York's Fifth Avenue." That is rather a mild

specimen. He becomes almost the staid experimenter in the best part of the book—on a study of the so-called emotional reactions of young children. He is wild theoretician constantly, but most of all in the enormous and unwarranted use which he makes of the facts of "conditioned reflex". He loves to appear as the valiant shocker of the 'respectable people of the villages'. "We no longer," he declares, "look upon the blue of the heavens above as a kingdom in which super-mundane beings dwell (at least some of us hardy souls do not!)". He must greatly have enjoyed the shiver that then ran through the Fundamentalist portion of his audience, supposing he had any, the shiver which, as a behaviourist, he would of course not fail to note. "I really am rather an outrageous person," he seems constantly to be saying, "and before I have done with you you will all admit it."

Perhaps I may be held to have gone too far in saying that this book discards the last remnants of caution. Certainly Watson very often *states* that we ought to be cautious. But perhaps, in his case, this is a genuine "laryngeal habit" At any rate the statement seems to have served its purpose by having been made. Here is a not untypical passage, which comes at the end of his discussion on emotions. "May the behaviorist, though, interject here a word of caution about his own views? All of his conclusions are based now upon too few cases and too few experiments. This will be remedied in the near future. More and more students are at work upon emotional behavior using behavioristic methods. No sane person can ever again use the old introspective method with which James and his immediate followers came so near wrecking this most thrilling part of psychology." The passage represents a very constant attitude. "We must be cautious," says Watson; "but for my part I certainly am not going to begin to be cautious just yet."

All this may succeed in conveying the correct impression that Watson has produced a book which is provoking, alive, amusing, and, provided there is no objection to a great amount of slang, attractive to read. But it may not suggest that, largely on account of a recklessness which from another point of view is very reprehensible, the volume contains numerous acute and true observations, about human life in general, a few genuine contributions to psychological knowledge, and a focusing of the essential problem of behaviourism which, to my mind at least, is perfectly just. To bring out the significance of the last two points I will give a very brief account of the topics with which Watson deals, and then select two of these for a slightly more detailed criticism.

The book first tries to say what behaviourism is and what methods of study it should use. Then come two very clever though sketchy chapters on "the human body". The next question is whether or not there are any human instincts, and, in the sense in which the term 'instinct' is now commonly used, Watson is sure that there are not. All but the very simplest kind of differential responses, and perhaps even those, are considered to be due

to minute, and, of course, unspecified, structural differences, together with a variety of stimuli that somehow "hurl" this structure into activity. But such a view need not prevent the behaviourist from saying a lot about the probable future of the youngest infant. Watson pictures the student of behaviour standing over the cradle: "The behaviorist would *not* say: 'He inherits his father's capacity or talent for being a fine swordsman'. He would say: 'This child certainly has his father's slender build of body, the same type of eyes. His build is wonderfully like his father's. He, too, has the build of a swordsman.'" Wonderful baby! And even more wonderful behaviourist! Surely here is Saul among the prophets with a vengeance.

Next come two chapters on emotional behaviour, mainly in young children. These contain some exceedingly valuable original observations and experiments and I will return to them later. They are followed by what has become the conventional behaviourist treatment of the growth of habit, and of the relation of talking and thinking. Watson now holds that not only the vocal apparatus, but all the body, can think. This of course puts him a bit further out of the reach of convincing experimental attack, and also a bit further out of reach of convincing experimental proof. It is extraordinary that Watson should still refuse to give up the "frequency and recency theory" of the establishment of habitual responses. To say that the correct or adequate terminal response in a series is learned because it is the most frequent response is merely to say the same thing twice over. For it is only the most frequent when it is learned. And to bring recency to the aid of frequency is like bringing one hole to mend another. The final chapter, on personality, maintains that this is only "a reflection of the genetic history of our habits". Some of the discussion consists of a strong condemnation of modern psycho-pathology and more particularly of Freud, for psycho-analysis excites Watson's vocal habits almost as much as religion.

The most interesting part of the book is the study of the emotional behaviour of young infants. Watson begins by cheerfully consigning to the waste-paper basket all the work done upon the subject prior to that performed by himself and his followers. He then tries to specify emotional reactions and this is what he says: "The more the behaviorist goes about examining the sets of reactions of adults, the more he finds that the world of objects and situations surrounding people brings out more complex reactions than the efficient use or manipulation of the object or situation would call for". Specify all these extra and unnecessary reactions and we have the emotional group. The position is highly speculative, as he himself points out. He thinks that if we had a sufficiently well developed technique we could experimentally determine in the laboratory "a physiologically sound and scientific way of reacting to" all of life's objects and situations. Any other ways would be emotional. This seems to be a most unpromising beginning; for

no attempt whatsoever is made to suggest how to discover what is "physiologically sound and scientific". However, the lack of such attempt does not matter very much, for the only practical conclusion is that we should give up the study of emotions in the adult, and turn to their observation in very young children. Watson and some of his students have done the latter, though not, I fear, the former, and he presents the facts observed in a most interesting manner. It appears fairly certain that there are only three types of "unlearned beginnings of emotional reactions". These are "fear," which is a specific form of—very complex—behaviour produced at first only by certain sudden loud sounds and the sudden removal of support; "rage," another specific form of behaviour at first produced only by forcible restriction of bodily movement; and "love," a third specific form dependent upon a variety of stimuli such as "stroking of the skin, tickling, gentle rocking, patting". It may be that there are other unlearned emotional responses, but these are the only ones of which we can at present be certain.

Out of these small beginnings all the enormously complex emotional life of the older child and of the adult develops. The development is, it need hardly be said, put down to the potent principle of conditioned reflex. As I hope to show, the adequacy of this explanation can be very strongly contested; but apart altogether from this Watson's observations and experiments are of a high degree of interest. He took a child who had hitherto shown fear reactions only to a sudden loud noise, and presented a furry animal —*e.g.* a rat, or a rabbit—several times together with the disturbing sound. Very speedily the fear reactions appeared when the animal was presented without the noise. With extreme readiness also the fear reaction spread to allied situations, the presence of cats, dogs, fur coats, cotton wool, hair, masks and the like. The readiness of this spread would, in fact, suggest to anybody but a confirmed behaviourist that some other factors than those involved in "conditioned reflexes" proper were operating. But Watson never discusses the possibility of this. Having induced a fear reaction experimentally Watson then tried to see whether he could also remove it experimentally. He claims to have done so. Two exceedingly interesting methods are used. I will quote one case. Bobby G., age 30 months, has an induced fear of furry animals:—

"Bobby was playing in the pen with Mary and Laurel. The rabbit was introduced in a basket. Bobby cried "No, no," and motioned for the experimenter to remove it. The two girls however ran up readily enough, looked in at the rabbit and talked excitedly. Bobby became promptly interested, said "What? Me see," and ran forward, his curiosity and assertiveness in the social situation overmastering other impulses."

Here, as generally happens when he gets interested in the case he is describing, Watson uses descriptive terms almost exactly as any other psychologist with a functional bias would use them.

The other case is equally interesting. Peter, also with an

induced fear of animals, is presented with a rabbit in a wide mesh wire cage, and at a considerable distance, *while he is busily engaged upon a meal.* The animal, at successive meals, is brought nearer and nearer, and eventually is placed in Peter's lap. First he tolerates and eventually he fondles the animal which he has been trained experimentally to fear. And there is the same spread in the removal of the fear as in its acquisition: "fear responses to cotton, the fur coat, and feathers were entirely gone".

At this point there is nothing like enough detail. Were the child's reactions after the "removal" of the fear really the same, qualitatively speaking, as before its acquisition? Or were there a new wariness, a new vigilance, a new kind of balanced interest or suspense about his behaviour? We are not told, but from my own observations I should be surprised if there were not. Also in these and in all the other cases recorded in the two most interesting chapters on emotional response, a very much longer period of continuous observation is needed if any safe conclusions whatever are to be drawn as to the determination and development of emotional life.

As I have indicated already, the crux of the Behaviourist position, so far as its *positive* contribution goes, lies in the use which it makes of "conditioned reflex". This book gives the strong impression that "conditioned reflex" is the Behaviourist's *only* genuine explanatory principle. It does not matter what is the problem, Watson meets, and apparently thinks he vanquishes it, by saying that here as everywhere else we have conditioned reflex at work. I have not the slightest hesitation in saying that the use which is made of conditioned reflex in this book is scandalous. That such use should have been made of the notion by a man who is as well acquainted with the experimental facts in regard to conditioned reflex as Watson evidently is, makes the matter all the worse.

Nowhere in this book is the difficulty of the experimental work on conditioned reflexes adequately stated. Nowhere are the elaborate precautions which have to be taken to guard against the great instability of even simple conditioned reflexes adequately described. A reader may think that it is a matter of great ease to establish them, to maintain them, to vary them quantitatively and qualitatively, to render them highly specific or highly general, in fact to do anything with them that the experimenter pleases. On pages 28 and 29 Watson summarises some of the most important general facts which have been actually ascertained in regard to conditioned reflexes. The summary, so far as it goes, is excellent, and that it may be misleading without supplementation and illustrative discussion can perhaps hardly be helped. Here are those points put more briefly still:

1. Conditioned responses are temporary and highly unstable, but once established they may, even after break-down, be more quickly re-established.

2. The substituted stimulus can be rendered specific. But Watson does not discuss the technique of this experiment, or its difficulty—both vitally important points if conditioned reflex is to carry even half the burden that he wants to put upon it.

3. The magnitude of the response depends upon the strength of the stimulus, and interruption of a stimulus has the same general effect as increase in its intensity. But once again Watson says nothing about the difficulties, and the complexities, and the exceptions which occur in relation to this point.

4. There is a marked summation effect.

5. Conditioned responses can be extinguished by rapid repetition of the stimulus, and by lack of practice, such extinction being entirely different however from so-called "fatigue". But Watson does not mention what is of far greater importance to the use which he himself goes on to make of the conditioned reflex, *i.e*, the ease with which it can be extinguished by any incoming, extra, peripheral stimulus.

6. The "unconditioned" stimulus has to be applied *after* the "conditioned" stimulus if the desired result is to be secured. This is an extraordinarily interesting and definite experimental fact the significance of which in regard to most of the relatively high level acquisitions which Watson calls conditioned reflexes ought to be thoroughly investigated. I would much like to see exactly how it stands in regard to a great many of the language acquisitions which are here treated as exactly equivalent to the conditioned salivary secretions of the dog.

Add to all these facts a knowledge of the difficulty of the technique of the experiments, and Watson's light-hearted use of the facts becomes almost incredible. It is highly to be desired that anybody who feels inclined to sanction this use should carefully study Dr. Anrep's forthcoming translation of Pawlow's important original work on the conditioned reflex.

Only two pages after his summary of the established experimental facts about conditioned reflexes Watson is saying: "In daily life I have seen many times an accidental contact with a hot electric iron or radiator condition a child (substitution of visual for tissue-destroying tactual stimulus) after one joint stimulation. We are shot through and through with such accidental conditionings from infancy onwards." He repeats the same sort of illustration again and again. But where, from the experimental literature on conditioned reflex, can he quote one similar example of a response at this level *permanently* and *stably* conditioned by one joint stimulation? Even if we say that there is nothing different here except the speed with which the reaction is set up, still the speed is an important and significant fact which has to be accounted for. Why is it that innumerable cases of some joint stimulations are not enough to establish conditioned reflexes, while a very few cases of other joint stimulations are enough? Or take again the emotional conditioning already referred to. Why is it that to extinguish these supposed

conditioned emotional responses a very highly specific situation is required? Half the difficulty with these reflexes at the salivary level is to keep them from being extinguished, so that a laboratory is constructed with sound-proof rooms, light-proof rooms, vibration-proof rooms, all because *any* extra stimulus tends to knock out the conditioned reactions.

Of course there may be answers to these questions and many others that could be asked. And the answers may perhaps be capable of expression in terms actually applicable to what is known about conditioned reflexes. It may be that the differences in speed and difficulty of establishment, in specificity of reaction, in stability and instability of response, which mark development from "low level" to "high level" behaviour, introduce no fundamentally new organising factors. It may be that they are capable of expression in terms of minute and completely unknown structural differences. But there is certainly no proof that this is so. And I cannot think what makes Watson so confident that one unknown is better than another. To assume that every single case in which one stimulus is substituted for another and every single case in which one response is substituted for another is a genuine case of the conditioned reflex principle in operation is I think a huge and unjustified assumption. Added to this, "substitution," a term Watson is very fond of, is one of the most slippery, unprecise, and accommodating words that it is possible to use.

I have, I hope, made it sufficiently clear that I do not think that, so far as this book goes, Behaviorism has made good its case on the positive side. But on the negative side it is so far in a much stronger position. The point here is not whether there is consciousness or not, for that is irrelevant to the main issue as it appears, and I believe as it rightly appears, in this volume. The point is whether consciousness actually *does* anything, whether it is a genuinely effective factor in the determination of any form of human response. I am not certain whether this has as yet been unequivocally shown to be the case by anybody. I think perhaps it might be shown; but that is another story, and this review is already unduly long.

Behaviorism is an exciting book, dogmatic, reckless, clever. If I also may take the mantle of a prophet for the moment, I would predict that if it succeeds in gaining many new adherents to its general theories they will come from among the ranks of those who rather like a fight.

F. C. BARTLETT.

Aphasia and Kindred Disorders of Speech. By HENRY HEAD, F.R.S. Cambridge University Press, 1926. 2 vols. in 4°. Pp. 550; 430. £3 3s.

Le bel ouvrage de H. Head est destiné à marquer une date importante dans l'histoire de l'aphasie, par l'ampleur de son effort, et

surtout par l'originalité de son attitude et la hardiesse de ses conceptions. C'est la première fois, en effet, que le problème de la pathologie du langage se trouve étudié par un neurologiste qui, à l'analyse clinique et aux données de l'anatomie pathologique, a su ajouter une expérimentation psychophysiologique systématiquement conduite, et qui, à la connaissance très précise et très complète de l'histoire médicale de l'aphasie, a su joindre une pénétration profonde des conceptions modernes de la physiologie et de la psychologie.

Des deux volumes, dont la forme élégante fait, une fois de plus, grand honneur à l'University Press de Cambridge, le second est consacré essentiellement aux 26 observations cliniques, relatées avec un soin minutieux, dans tous les détails des données d'observation et des résultats expérimentaux, qui illustrent les thèses de l'auteur, et apportent en tout cas un matériel précieux à tous les théoriciens de l'aphasie et du langage.

Le premier volume comporte une première partie, historique; une deuxième partie, la principale, consacrée à l'exposition générale des méthodes d'investigation, à l'indication des troubles généraux rencontrés dans l'aphasie, à la distinction des types cliniques principaux, et à l'effet des perturbations aphasiques sur les différentes formes du comportement (verbal, graphique, musical, etc.); une troisième partie traitant des localisations et des lésions cérébrales qui se rencontrent dans les divers types cliniques d'aphasie; enfin une quatrième partie où sont envisagés quelques problèmes généraux de physiologie et d'anatomie pathologiques du système nerveux (notion de vigilance, nature des localisations cérébrales) ainsi que de psychologie (langage et pensée).

A la fin des chapitres, des conclusions claires condensent avec précision la pensée de l'auteur, et des sommaires résument les données principales des différentes parties de l'ouvrage.

Head, dans son historique, consacré à quelques époques et à quelques hommes représentatifs de certains modes de pensée bien caractéristiques, retrace les premières conceptions jusqu'à Gall, consacre un important chapitre aux débuts de la période moderne, de Bouillaud à Broca, alors que les localisations cérébrales de l'aphasie fournissaient un aliment aux controverses métaphysiques, et même politiques en France, rend ensuite justice aux conceptions de Hughlings Jackson qui avaient été si complétement oubliées, accorde quelques pages aux fabricants de diagrammes et de schémas, du moins aux anglais et aux allemands, sans parler de Charcot qui eut pourtant à cet égard une influence considérable pour la diffusion et la vulgarisation des concepts schématiques, passe à la révolution de Pierre Marie l'«iconoclaste» et insiste sur le chaos actuel, en passant en revue les travaux de Henschen, de Von Monakow, de Liepmann (Apraxie), des théoriciens de l'agnosie, des psychocliniciens.

Il remarque combien peu la vaste expérience clinique de guerre a été utilisée au point de vue de l'analyse des fonctions cérébrales à

laquelle les neurologistes étaient si mal préparés ; il a tout au moins pu, lui même, consacrer de fines études à l'analyse des troubles aphasiques chez des blessés de guerre, et édifier des conceptions qui se rattachent directement aux vues profondes du grand précurseur, Hughlings Jackson.

Il y a plus de 50 ans que ce dernier affirma que les noms d'aphasie, amnésie, apraxie, agnosie, désignent des formes de comportement anormal que l'observation doit préciser, des variétés d'activité morbide en relation avec des modifications cérébrales, mais incapables de fournir des critères pour la localisation des fonctions normales ; qu'il déclara que l'on ne peut parler de "centres" du langage, mais seulement de sièges de lésions organiques entraînant des troubles spécifiques dans les fonctions verbales.

Comme Hughlings Jackson, Head est un empiriste qui se défie de l'apriori et des schémas théoriques préconçus.

C'est par analyse entièrement empirique, fondée sur une série d'épreuves expérimentales, de tests (nommer et reconnaître des objets usuels, des couleurs ; lire et écrire après audition de mots, vue de mots ou de dessins ; dire l'heure ; montrer la main, l'oeil, l'oreille, droits ou gauches, etc.) que Head est parvenu à sa classification fondamentale des troubles aphasiques en quatre variétés cliniques : verbale, syntactique, nominale et sémantique, pierre maîtresse de son œuvre.

Dans l'aphasie verbale, ce qui apparaît comme caractéristique, c'est la difficulté de constituer des mots, aussi bien pour le langage intérieur que pour le langage externe ; alors que la compréhension est peu atteinte, la répétition est souvent impossible.

Dans l'aphasie syntactique, les mots ne manquent pas, mais c'est leur disposition en phrases coordonnées qui est l'écueil ; la syntaxe fait défaut ; l'écriture est plus facile que la parole, la compréhension est assez bonne.

L'aphasie nominale implique au contraire une incompréhension générale de la valeur significative des mots et symboles.

Enfin, c'est la compréhension exacte des phrases, des groupements verbaux, qui caractérise l'aphasie sémantique, alors que la signification élémentaire des mots n'échappe pas ; la valeur du nombre est connue mais l'opération arithmétique est impossible.

Les différents types cliniques se distinguent dans l'examen du comportement général, pour ce qui concerne, non seulement la parole, l'écriture, la lecture, mais encore l'emploi des nombres, le dessin, la musique, le maniement logique des images visuelles, etc.

L'atteinte aphasique peut naturellement être plus ou moins complète, et, pour chaque catégorie de troubles, on constate, suivant une loi tout à fait générale, que les opérations les plus difficiles sont aussi les plus affectées, que les plus récentes sont les plus fragiles, mais aussi les moins spécifiquement touchées. Dans la récupération, les fonctions les moins atteintes se rétablissent les premières.

Au point de vue de la nature et du lieu des lésions qui conditionnent les différents types d'aphasie, dans la mesure où les quelques observations utilisables (par repérage sur le vivant des blessures cérébrales) permettent de déterminer de telles relations, voici ce qui se dégage :

Aucune différence appréciable ne se note entre les lésions corticales et sous-corticales. L'aphasie verbale est liée à une atteinte de la portion inférieure des circonvolutions centrales, l'aphasie syntactique, avec jargon, à une lésion du lobe temporal, les aphasies nominale et sémantique à des atteintes de la région située entre la scissure post-centrale et le lobe occipital (zone du gyrus angulaire, du gyrus supra-marginal, du lobule pariétal, etc.).

Ces relations n'impliquent pas l'existence de "centres définis" du langage, avec isolement de mécanismes fonctionnels dépendant de régions limitées du cerveau. En effet, le langage comporte, dit Head, une interaction harmonieuse de multiples processus fort complexes.

L'ensemble des fonctions peut être désigné comme "formulation et expression symboliques," et correspond a un haut degré d'intégration ; on ne peut séparer une fonction de la parole, une fonction de la lecture, une fonction de l'écriture, car ce sont là des formes de comportement auxquelles ne correspondent pas des fonctions spécifiques et isolables.

Le système nerveux n'est pas une mosaïque de centres indépendants ; il fonctionne comme un appareil dont toutes les parties sont solidaires avec des niveaux différents d'efficience, dépendant de l'intégration et de l'adaptation "purposive," des niveaux de "vigilance" (dont la forme psychique est connue comme niveau d'attention) ; et l'aspect psychique des fonctions ne peut être séparé, dans une forme quelconque de comportement, de l'aspect purement physiologique et automatique.

C'est cette unité et cette solidarité fonctionnelles qui expliquent que les troubles du langage ne peuvent être étroitement compartimentés ; une atteinte du système retentit sur tout l'ensemble ; on ne peut avoir un trouble isolé de la compréhension ou de l'expression, de la formulation de la pensée, ou de sa traduction verbale. Mais il y a des prédominances fonctionnelles dépendant de la gravité de l'atteinte (les opérations les plus difficiles, les plus récentes étant les plus fragiles) et du siège des lésions.

Telles sont les vues profondes dégagées par Head de son étude clinique, et qui sont, dans l'ensemble, aussi justes que fécondes.

Toutefois, par réaction légitime et nécessaire contre les schématisations excessives—que l'effort purement négateur de Pierre Marie avait déja visées —, je pense que Head ne tient pas suffisament compte de ce fait—qui se dégage de ses observations anatomo-pathologiques—qu'il y a des régions cérébrales privilégiées au point de vue des mécanismes fonctionnels présidant à certaines formes de comportement, et qu'ainsi, malgré la solidarité générale du système nerveux et la complexité des opérations, automatiques et

psychiques, en jeu, il peut y avoir des perturbations vraiment électives que n'explique pas la loi générale de l'ordre d'atteinte fonctionnelle (des processus les plus fragiles).

En particulier, même si l'on élimine de l'aphasie les apraxies verbales (aphasies motrices pures) et les agnosies verbales (cécité verbale pure, ou alexie, correspondant à une agnosie visuelle spécialisée ; surdité verbale pure, correspondant à une forme définie d'agnosie auditive), dont la réalité ne peut plus faire de doute, il n'en reste pas moins que, dans toutes les formes cliniques d'aphasie décrites par Head, il y a participation plus ou moins marquée de ces troubles apraxiques (aphasie verbale) ou agnosiques (aphasies nominale et sémantique).

Or l'insertion dans le comportement moteur de la pensée verbale, ou l'insertion du comportement sensoriel dans la pensée verbale, correspond à des mécanismes praxiques et gnosiques qui paraissent, d'après de multiples observations anatomo-cliniques, assez étroitement localisés, et qui dépendent, d'après la conception que j'ai soutenue, de centres " coordinateurs ".

Nous sommes aux confins de la grande fonction du langage (expression et formulation symboliques) ; mais c'est par là que le langage peut remplir sa fonction essentielle d'instrument social, mettant l'individu en rapport avec la collectivité. Toutefois, je ne veux pas, à l'occasion du bel ouvrage de Head, me laisser aller à un exposé de mes propes conceptions, que l'on trouverait dans mon livre sur « le Cerveau et la Pensée », dont il paraît justement une édition anglaise.

Si je ne pense pas que le problème de l'aphasie puisse être définitivement résolu par les importants travaux de Head,—et ce serait faire injure à l'auteur que de lui prêter semblable opinion—il n'en reste pas moins que c'est dans son ouvrage que le problème est le mieux posé, dans l'esprit de la science psychologique et physiologique moderne, et que c'est son oeuvre qui a réalisé, pour la connaissance précise de l'aphasie, le progrès le plus substantiel, en fournissant des documents expérimentaux de premier ordre, que les théoriciens de l'avenir ne manqueront certes jamais d'utiliser.

HENRI PIÉRON.

Plato : The Man and His Work. By A. E. TAYLOR. London : Methuen and Co., 1926. Pp. xi, 522. 21s.

THE appearance of this book is an event of first-rate importance in the progress of philosophical studies in England. It is a remarkable fact that, in spite of all the work that has been done on Plato, no book on a scale approaching this has appeared in English since the great work of Grote. And the appearance of such a book, in which we could read an authoritative statement of what could be said about Plato on the basis of the work of the last fifty years, was long overdue. The publishers deserve a word of congratulation for their

conception of the work, and more than a word for their choice of author, unless, indeed, we were to say that their choice was so clearly dictated to them that no other would have been possible. For there is clearly no one better fitted for the task than Prof. Taylor. No one combines to the same degree the classical and philosophical knowledge necessary for the interpretation of Plato. And few philosophers can approach him in the capacity for putting what he has to say in a style not unworthy of his subject. His method of dealing with his subject in the present book is dictated by the object for which it is written. It is intended primarily, as he tells us in the Preface, for the student of philosophy who wants to know what Plato says. And he aims, therefore, rather to sum up the results that have been arrived at than to add to or modify them. There are few traces here of the Taylor of *Varia Socratica* with its brilliant guerilla warfare against current views and its striking, original, and occasionally rather perverse advocacy. We have instead the massive and authoritative summing up of a judge. Yet even the mere summing up of results cannot help adding something to them, if it is well done. And even those whose study of the subject has advanced beyond the stage of the student will have much to learn from Prof. Taylor's book.

The plan of the book is simple. It begins with two introductory chapters, the first on Plato's life, and the second on his writings, in which questions of genuineness, order, and date are discussed. After that, the whole of the book, with the exception of the last chapter on the theory of Forms as Numbers, is devoted to a careful and detailed summary of each dialogue in turn, with comment and explanation at such points as seem to require them. Such comment not infrequently takes the form of a parallel in modern thought with the view put forward or the question discussed by Plato. And Prof. Taylor's use of such parallels is always interesting and suggestive, though there would naturally be differences of opinion in particular cases about the real degree of closeness in the parallelism. Another feature deserving of special notice is the great care with which Prof. Taylor discusses the supposed dramatic date of each dialogue. I have found no such thorough and convincing treatment of this point anywhere else.

The object of Prof. Taylor in adopting this method has been, as far as possible, to keep his own point of view in the background and to let Plato speak for himself. In this he has been, in general, completely successful. No one can accuse him of doing what he expressly repudiates, and attempting "to force a 'system' on the Platonic text." Indeed, if criticism of his general method could be made it would probably come from the other direction as a complaint that he had carried his austere suppression of self too far. If I try to put myself in the position of a student at the stage for which the book is primarily intended, I am certain that I should find the summaries of dialogues extremely helpful. But I think that I should be even more grateful for a somewhat fuller discussion of

the debateable points in their interpretation, and I am sure that I should be most grateful of all for a good deal more in the way of a general summary on certain points or of certain stages, without which most students, I fancy, would run the risk of getting lost in the maze of details. If necessary, I should feel prepared to sacrifice a certain amount of the detailed summary for this.

This is not to ask for a system to be imposed on Plato. Indeed, Prof. Taylor does what is clearly a valuable service in insisting that there is no system, in his sense, to be looked for in the dialogues as we have them. But it is equally important to remember that Plato, as a serious thinker, must have been aiming at a system as an ideal of thought. And one would have thought that it would be both possible and helpful to indicate somewhat more fully the general lines of thought that run through different dialogues. There is no doubt that such a task would be easier if a certain amount of re-arrangement of material had been made according to the nature of the subject discussed instead of adhering so closely to the order of the individual dialogues. Prof. Taylor expressly rejects this way of proceeding on the ground that it would tend to confuse the earlier and the later views and "obliterate every trace of the development of Plato's thought". That would certainly be a great evil. And if the only alternative were the kind of treatment that Prof. Taylor has in mind in this criticism his own method would certainly be preferable. But surely a compromise would be possible by which the contribution of the dialogues to the main different branches of thought might be treated separately, while within that framework the historical method of examining dialogue by dialogue in their chronological order should be retained. There would, of course, be difficulties in the use of this method as in any other. And in any case it would be foolish to press such criticisms too far against Prof. Taylor. No two people would probably agree as to the ideal method of presentment. And it may well be that Prof. Taylor's method will in practice prove more valuable for the student than would that which I have suggested.

One result of this method of treatment, however, is clear. The task of the reviewer is made more difficult. Instead of having a few main general conclusions to discuss, he has to content himself with a series of comments on more detailed points. I will try to indicate briefly some of the points which appear to call more specially for discussion. And if I may seem to dwell too exclusively on points of difference it is only because it is on such points that there is most to be said. A series of "Hear, hear's," which would be the most appropriate comment on the bulk of Prof. Taylor's exegesis, would make dull reading.

The first chapter, on Plato's life, calls for little comment. It shows a sane scepticism about a good deal of the material for this, and provides a valuable corrective for those commentators who take every statement in Diogenes or Olympiodorus as an established historical fact. The biographical material in the letters, particularly

the Seventh, is used with skill. It serves, in particular, to throw the relations of Plato and Socrates into what is probably their true light. Their relations were that of older and younger friend, not of master and disciple. And it was the shock of the execution of Socrates rather than his positive teaching which turned Plato to the life of philosophy.

The discussion of the writings is admirable. Nearly all Prof. Taylor's conclusions about the genuineness of doubtful writings seem convincing, though there is possibly a little too much certainty about the Letters. I do not see, for instance, why the acceptance of VI, VII, and VIII should "logically" demand the acceptance of II, III, and XIII, or indeed how logic comes into the matter here for those scholars who think that they have found suspicious details in these latter which are not in the former. Still, I am personally inclined to accept them all, though with very much more hesitation than Prof. Taylor. On the question of the order and date of the dialogues Prof. Taylor bases himself to some extent on the conclusions of the investigators of the details of style. In this he certainly does well. Stylistic investigation, in the hands of a master like Constantin Ritter to whom Prof. Taylor pays a well-deserved tribute, has produced such valuable results and met so fully all the tests to which it has been put that its general conclusions ought by now to be accepted as established. My only complaint against Prof. Taylor is that he has not enough confidence in it. And this leads him to an opinion on one most important point which I do not think can be maintained.

Prof. Taylor places the *Republic* in or about the year 387 on the strength of the well-known allusion in the Seventh Letter to Plato's belief in the necessity of philosophers becoming rulers or rulers philosophers. The *Theaetetus* he places about 368, and certainly the weight of evidence is in favour of the battle referred to there being that of 369. But one point on which almost all stylistic investigators from Campbell to Ritter agree is that the *Republic* is stylistically to be put in the same group as the *Theaetetus* and is separated by marked differences from dialogues like the *Phaedo* and *Symposium*, which come at the end of the earlier group. If, then, there is anything in these stylistic investigations at all, it is practically impossible that there can be an interval of twenty years between the *Republic* and the *Theaetetus*, and the former dialogue must be at least ten or twelve years later than Prof. Taylor puts it. The only important argument against this is the passage in the Seventh Letter, and it may well be argued that this is not nearly as decisive as Prof. Taylor regards it. The Letter, after all, was not written to help us date the dialogues, and there is no reason why Plato should not have antedated the exact phrases that he used. All that it is absolutely necessary to suppose is that the idea was in his mind (*ταύτην τὴν διανοίαν ἔχων*) when he went to Sicily. And it is clear from the *Gorgias* that such an idea was germinating in his mind before the date of the *Republic*. Given this, he may well

have summed up his state of mind by using a phrase in the letter which was actually only coined at a date later than that referred to. Or, what is perhaps more likely, he may have coined the phrase some time before it was published in the *Republic*. Prof. Taylor seems to me to weight the evidence slightly on one side by translating ἐπαινῶν τὴν ὀρθὴν φιλοσοφίαν as "in a eulogy on genuine philosophy". The English here suggests that this particular phrase was part of a larger composition in a way in which the participle in Greek, so far as I can see, does not.

The point is of great importance because it affects our whole view of the dialogues. On Prof. Taylor's view the *Republic*, and probably the *Phædrus* which goes with it, are merely the last of a series of dialogues published in the first twelve years of Plato's literary activity. And we should expect, therefore, that the general characteristics and point of view of all these dialogues should be the same. There is then an interval of about twenty years, and when he starts writing again it is with a point of view which must have been considerably modified in the interval, and the dialogues which follow must be regarded very differently. On the other view, there is no reason to assume such a wide divergence between two different groups of dialogues, and their approximation to one another may be supposed to have been much more gradual.

The point has an obvious bearing on the question of the significance of the figure of Socrates in the dialogues. Prof. Taylor has, of course, been closely implicated in the controversies over this question. But in the present work we find that, relatively speaking, the whole dispute sinks into the background where it properly belongs. Prof. Taylor, it is true, maintains that in all the earlier dialogues the main object is "to immortalise the personality of Socrates". But, even if this is true, it need not affect our attitude towards the dialogues, unless we hold that their object is purely biographical and that they do not necessarily represent Plato's own beliefs or point of view at all. This, though the indications are not perfectly decisive, does not appear to be Prof. Taylor's view. At any rate, he treats the dialogues, even the earliest, as evidence for Plato's own thought, even though he holds that the lines of thought represented there were, in the main, taken over by Plato from Socrates.

Prof. Taylor is, therefore, at one with most earlier commentators in distinguishing a Socratic period, in which Plato is expounding his own point of view which is also the point of view of Socrates, and a later period in which, though he still sometimes, as in the *Theaetetus* and the *Philebus*, uses the figure of Socrates as his mouthpiece, he is expounding a point of view of his own which goes considerably beyond anything that he learnt from Socrates. The important difference lies in the point at which he believes the Socratic period to end. For him it goes down to and includes the *Republic*, and he therefore attributes to Socrates the Theory of Forms, as presented in the *Phaedo* and the *Republic*, and also,

presumably, the main lines of the political speculations of the latter dialogue.

Our decision on these specific points will turn on a detailed consideration of many different pieces of evidence, internal and external. This is not attempted here by Prof. Taylor, and would indeed hardly be appropriate, though there are indications of certain lines of argument which he would adopt. These will probably not appear very convincing except to those who are already convinced on other grounds. Thus the argument that the Theory of Forms, if it was really the invention of Plato, could not be represented by him as already familiar to Socrates and his contemporaries, only has weight if we are already convinced that it was Plato's primary object to give an exact historical picture of the views of his characters. Consistently applied, this consideration should lead us to deny the presence of any original idea of Plato's in any of the dialogues, except the *Laws*. It would be out of place to discuss the question more in detail here. But I will mention one piece of positive evidence on the other side, because I have always been particularly curious to know how Prof. Taylor would deal with it. That is the passage in the Seventh Letter already referred to in connexion with the question of the date of the *Republic*. Whatever its bearing on that problem, there is one point in it which on the face of it, at any rate, appears absolutely clear. And that is that Plato here represents the main thesis of the *Republic* as his own conclusion arrived at gradually as a result of his own experience a good many years after the death of Socrates.

This point is important, for it brings us to what for me,—as I believe it will be for many others,—is the chief point on which doubts may be felt about Prof. Taylor's general view of at any rate the earlier dialogues. On the view that I should maintain, from the first Plato's primary object in all his activities, literary as well as any other, was to do something to meet the necessities of his own time. This view is not incompatible with the view that in some dialogues he also aimed at giving a life-like portrait of Socrates. For he may well have felt that one of the chief intellectual and moral needs of the time was an application of the spirit and methods of Socrates to a consideration of its problems. But I should maintain that the first interest was the primary one, and that the purely biographical interest was secondary, and would yield to the other and suffer such modification as it demanded. The modification, under such conditions, would naturally be gradual. And it would probably have often been difficult for Plato himself to say how far he was presenting what he had learnt from Socrates, how far he was developing what he himself believed to be implicit or logically involved in the ideas of Socrates, and how far he was going beyond his teaching altogether. From this point of view I should question the legitimacy of Prof. Taylor's sharp distinction between the earlier and the later dialogues. Indeed I am inclined to doubt the value of any attempt to mark off a specifically Socratic period at all.

A further consequence of this view would be that all the discussions in the dialogues must be regarded as having an application to the thought or the conditions of the time at which they were written. The most obvious case of this would be the comments on political conditions, particularly in the *Republic*. Prof. Taylor insists more than once that these comments, more especially the criticisms of democracy, are meant to apply solely to "the Athens of Nicias and Cleon," and that "the satire would be wholly beside the mark if directed against the drab and decent *bourgeois* Athens of Plato's manhood." This really seems to me an extraordinary misrepresentation. I can find nothing in Plato's criticism which would not apply at least as closely to the Athens of the first part of the Fourth Century as to the Athens of the Archidamian War. "Drab and decent *bourgeois*" seems a singularly inappropriate phrase for the Athens revealed in the *Ecclesiazusæ* or the speeches of Lysias: in fact it could hardly be applied with any plausibility to any period before the rise of Eubulus in the last years of Plato's life. I should hesitate to set my own impression against that of Prof. Taylor's were it not supported by weighty authority. If we read the account of the state of things in Athens and Greece in general at this period, say, in the brilliant description of Eduard Meyer, and then compare it with the description of the different constitutions in the Eighth Book of the *Republic* we shall be struck again and again by the remarkable closeness of the parallels. We are, however, possibly apt to assume too readily that Plato had Athens, at one period or another, exclusively in his mind. He was acquainted with other cities. And the descriptions, in the Seventh and Eighth Letters, of the impression made on him by the Italian and Sicilian cities has many points of resemblance, sometimes almost verbal, with passages in the *Republic*. At any rate I am convinced that any view which represents Plato as interested primarily in the historical reconstruction of a past period is an absolute misunderstanding.

The same consideration would apply to the representation and criticism of positive views, of a more philosophical nature, in the dialogues. It is not necessary to deny that the views, or something like them, were actually held by the historical characters to whom they were ascribed. But I cannot believe that Plato would have brought them in unless they were also current at the time of writing. Prof. Taylor generally adopts this point of view for the later dialogues: but it appears to me to apply equally to the earliest. This does not mean, however, that we must look for a particular contemporary individual, disguised under the name of a character of a generation earlier, in each dialogue. Prof. Taylor does good service in protesting against some of the more forced interpretations of this nature. In particular, he is clearly right in rejecting the attempts of some German scholars to discover allusions to Antisthenes everywhere. Some of these supposed allusions, such as those in the *Euthydemus* and the *Cratylus*, are really quite inconsistent with

what we know about Antisthenes from other sources. On the other hand, Prof. Taylor seems to me to push scepticism to an unnecessary length in refusing to see a reference to him in the *Sophist*, where the views described are quite consistent with the rest of our knowledge of him.

Though it has no direct connexion with the points just made, I might take this opportunity of expressing a doubt about Prof. Taylor's identification of the εἰδῶν φίλοι with the Pythagoreans. The authority of Proclus is of doubtful weight. And it seems difficult to reconcile what we know of the latter with what Plato tells us of the former. In spite of Prof. Taylor's assertion, I cannot see how the view of the Pythagoreans that things are numbers, a view which seems to identify the sensible and intelligible realities, can be identified with the views of the Friends of the Forms which insist on an absolute separation between the two. Prof. Taylor will not admit the old theory which identified them with the Megarians, on the ground that these, as successors of the Eleatics, could only admit the One reality. We do not, however, really know enough about them to assert this with absolute certainty. And there are many considerations which point to some connexion between the two. The objections to an identification with the Megarians would not apply if we could find some thinkers who had been influenced by the Megarians, without necessarily adopting all the tenets of their school, and at the same time had had some kind of connexion with Plato. So that I am inclined to think that Prof. Taylor's earlier conjecture of Polyxenus and Bryson, who appear from the very little that we know of them to fulfil these conditions, was more happily inspired than his present view.

When we turn to the detailed treatment of the individual dialogues it will only be possible to single out a very few of the chief points whether of agreement or difference on which comment seems called for.

Prof. Taylor's exegesis of most of the earlier dialogues would, I think, command general approval. But I would make one comment on his summary on pp. 26-28 of the general ideas which underlie all these dialogues in common. As they appear to be taken for granted throughout Prof. Taylor holds that they may reasonably be regarded as a legacy from Socrates. I would not dispute the belief that they were probably held by Socrates. But it appears to me that a good many of these principles, as formulated by Prof. Taylor, are not specially Socratic or specially Platonic but are rather the assumptions implicit in normal Greek thought and language. They seem to be not only taken for granted by Plato, but represented by him as taken for granted by Socrates, and, what is more to the point, by his interlocutors also.

One point on which I venture to think Prof. Taylor's view will never command general assent is his judgment on the relative position and merits of the *Gorgias* and *Protagoras*. The *Gorgias*, in spite of its moral elevation, appears to him far too long and at

times even tedious, and he considers that its general style and construction show signs of immaturity which justify him in putting it comparatively early among the dialogues. The *Protagoras*, on the other hand, he regards as showing far greater maturity of powers, and he places it together with the *Phaedo*, *Symposium* and *Republic* at the end of the first group.

It can only be here a question of setting personal impression against personal impression, so that I must content myself with recording my emphatic dissent from the relatively unfavourable judgment on the *Gorgias*, which appears to me unquestionably a much more mature work, both in its outlook and its literary power, than the *Protagoras*. The latter dialogue displays just those qualities of humour and dramatic sense which we might expect from a relatively young writer, though, of course, we must not exaggerate Plato's youth. But it appears to me incontestable that it shows a comparative lack of skill in the handling of a prolonged argument and a certain awkwardness in the connexion between the different stages. It is true that Prof. Taylor attempts to explain these connexions. But here, more than anywhere else, I feel that we are presented with Prof. Taylor's conjectures rather than with Plato's own work. There are, indeed, many points in the exegesis of the *Protagoras* on which I am unable to find Prof. Taylor perfectly convincing. It does not, for instance, seem to me justifiable to represent Protagoras as "a strong believer in the view that morality is dependent on *νόμος*". He holds, it is true, that it needs the training of the city to develop it. But he is equally clear that the capacity for this development is the gift of the gods to all men. His position on this point, in fact, is very much like that expressed by Aristotle in the *Ethics*. Nor, again, does it appear to me correct to represent him as tacitly assuming that morality is entirely relative to the particular state. Nor does the treatment of the development of a hedonistic view by Socrates at the end of the dialogue seem convincing. No doubt we cannot assume that Plato held, or meant to represent Socrates as holding, such a view as a definite conviction of his own. But there appears to be even less reason for holding that it is merely put forward as the development of a popular view which Plato, or Socrates, definitely regarded as erroneous. There is really nothing in the words of the dialogue to suggest this. And I should regard it as a view put forward tentatively as a possible way, worthy of further consideration, in which ordinary assumptions about the relations of virtue and knowledge might be developed into a consistent system.

When we come to the *Phaedo* and the *Symposium* we find Prof. Taylor at his very best in the summary of the main arguments of these dialogues. But his treatment of the Theory of Forms here and in the *Republic* might appear somewhat too slight. There are certain difficult points of interpretation, particularly in the *Republic*, which are not discussed at all. And from my own experience with students I should have thought that it would have been worth while

to give a few pages to a preliminary explanation of what sort of things the Forms are. There are some rather debateable points, also, in Prof. Taylor's allusions to the adumbrations of the theory in earlier dialogues. In particular, I cannot understand his statement that no one denies that "the whole characteristic metaphysics of the *Phaedo*, the theory of Forms and the doctrine of 'Reminiscence,' are explicitly taught in the *Meno*." The doctrine of Reminiscence, of course, is there. But I should have thought that most people would deny that the theory of Forms as given in the *Phaedo* was to be found in the *Meno*. There is no trace there of the essential point of the doctrine that the Forms are not "in" the particulars, but "beyond" them with an independent existence of their own,—*παρὰ ταῦτα πάντα ἕτερον τι*, to use the phrase of the *Phaedo*. Indeed, I should have thought that the *Meno* was one of the most obvious cases where we should expect an allusion to the theory, if it had been already formed then, which we do not get.

The treatment of the *Parmenides* marks a definite advance in the progress of Platonic interpretation. The usual tendency of scholars some years ago was to regard the dialogue as reproducing criticisms of the Theory of Forms which Plato took very seriously, and to look for the results of these criticisms in a modification of the theory on lines suggested in the second part of the dialogue and made apparent in the use of the theory in later dialogues. Prof. Burnet was, I believe, the first English scholar of importance to adopt a different view, which is now accepted by Prof. Taylor. The *Parmenides*, on this view, is, all through, "an elaborate *jeu d'esprit*". It reproduces arguments against the theory put forward probably by the Megarians, and retorts upon these by showing, in the second part, that by using this kind of argument their own doctrine of the One can be reduced to a still greater absurdity. But Plato never regarded the difficulties raised as real difficulties, nor is the method of argument used one that he himself regarded as of value.

I am absolutely convinced by the arguments of Prof. Burnet and Prof. Taylor that this interpretation is sound. Prof. Taylor shows clearly the arguments in its favour that can be derived from a consideration of the dialogue itself. But the explanation derives its chief force from the impossibility of finding any rational positive doctrine in the second part, and the equal impossibility of finding in later dialogues any modifications of the theory in directions that these criticisms would suggest. The attempts of earlier commentators to discover both these things must, I should imagine, have struck even their authors as extremely unconvincing. One might add that, taken on their merits, the arguments are of no real weight. They are, in the main, merely verbal and consist in pressing the literal interpretation of terms which are necessarily metaphorical. The only real conclusion from them is not that the relation of the Forms to the particulars does not exist but that we have not adequate language to describe it precisely.

Prof. Taylor seems to me rather loath to draw the further conclusion that there really is no substantial alteration of the theory from its earliest form at all. There are, of course, many additions to it and discussion of many further problems, such as the relation of the Forms to each other, the place of soul or mind, and the internal structure of the Forms. But the core of the theory remains unchanged, as we can see from the statement of it in the *Timaeus*. I should, therefore, demur to Prof. Taylor's way of expressing himself in the discussion of the *Sophist* when he says that the earlier theory of Forms "is simply not relevant to the issues that Plato now finds himself called on to face". I should rather say that it is taken for granted as the basis from which these further investigations start. Again, I would suggest that Prof. Taylor attaches far too much significance to the absence of any mention of the Forms in the *Theaetetus*. If that dialogue is, as I take it to be, a kind of critical essay on current theories of knowledge, Plato may well have wished to carry on the discussion on more or less common ground and not to make his demonstration of the inadequacy of these theories depend on an acceptance of his own particular doctrines.

The account of Plato's final metaphysic as given in the *Timaeus* and the *Laws* cannot be adequately discussed here. Prof. Taylor seems to me quite convincing in his insistence on the absolute destinction between God or soul and the Forms. It is to be hoped that the last has been heard of the views which would reduce Plato to a Hegelian Monist by interpreting him as identifying the two. On the other hand, I cannot follow him in his scornful rejection of what he calls the superficial view that matter is regarded by Plato as an independent principle, not wholly subject to mind and containing in it the source of evil. He makes, as it seems to me, much too little of the fact that it is only "for the most part" that Necessity is "persuaded" by mind, and the Creator only makes the world good "as far as possible". It seems to me clear that matter is regarded as an alien, resistant element which limits the activity of mind, and is hence the source of imperfection and evil. Not only are there indications of this in the *Timaeus* and in other dialogues, like the *Politicus,* but this interpretation is also supported by the evidence of Aristotle, Theophrastus and, most clearly of all, by Eudemus in a passage quoted by Plutarch. Nor is it really incompatible with the passage in the *Laws* about the necessity of supposing more than one soul in order to account for the evil in the world. Of course, any actual evil occurrence must be the work of a soul. But why is such a soul evil or imperfect? Surely because of the influence of its body on it, *διὰ πονηρὰν ἕξιν τινὰ τοῦ σώματος*, as Plato says in the *Timaeus*.

The discussion of the difficult problem of the evidence of Aristotle and the doctrine of the Forms as Numbers in the last chapter represents the results of an important investigation which will probably throw valuable light on this obscure question. For a full consideration of it we must wait for the completion of the more

detailed examination by Prof. Taylor which is now appearing in this journal. The greater part of the discussion in the book is devoted not to the question of why Plato made the Forms numbers, which is treated very briefly though, so far as I can see, convincingly, but to the question of the meaning of the analysis of the numbers themselves into the One and the Indefinite Dyad. It is an interesting suggestion that Plato started from a consideration of irrational numbers and was led from this to apply this view to the integers. I do not think, however, that it can be established that Aristotle's objections to the *χωρισμὸς* of the Forms from the sensibles had any special connection with this doctrine.

There are many other points on which comment, whether in the way of agreement or disagreement, might be made. But to treat the book adequately would need another book of equal length. It only remains, therefore, to express once more the profound gratitude and admiration that all students of Greek Philosophy must feel for the completion of this great work.

G. C. FIELD.

VI.—NEW BOOKS.

Essays in Ethics and Religion with other papers. By JAMES SETH, late Professor of Moral Philosophy in the University of Edinburgh. Edited with a short memoir by A. SETH PRINGLE-PATTISON. Edinburgh and London: William Blackwood and Sons, 1926. Pp. xxxviii, 208.

ALL who were the late Professor Seth's students in Nova Scotia, Providence, Cornell, or Edinburgh, and a great many others too, will welcome this memorial volume with the liveliest, although necessarily with a melancholy, interest. Unfortunately, Professor Seth left nothing substantial unpublished. His delight in teaching allowed him but little leisure for writing, and he died within a month of his retirement from office. Had things been otherwise, we might reasonably have expected something mature and balanced from his graceful pen. As things are, this volume is all we would have it be. An admirable memoir by his brother, an adequate selection from the carefully pondered abstracts he was accustomed to dictate to his class, a delightful 'lecture upon lecturing' in which (although defence was surely unnecessary) he does completely defend his own unusual but conspicuously successful method of teaching, two characteristic graduation addresses, and a penetrating personal impression, entitled 'Halifax Revisited,' form the more intimate part of the book, and at the close there is a complete list of his published works. The major and, so to say, the more public portion of the volume contains half a dozen essays and addresses.

Of these the most important seems to be the second, although the place of honour is given to a survey entitled 'The Practical Interest of Ethics Casuistical and Social.' The remaining four deal with Christianity, Ethics and Social Welfare. These, while typical of the man and of his interests, admirably adapted to the occasions on which they were delivered, and (it goes without saying) pleasant to read, do not attempt anything very close in the way of reasoning or construction. The first essay, again, seems to have halted at a point beyond which its author would surely have carried it had he returned to the problem. As it stands, Seth's contention is that ethics in its practical application is *not* casuistical and *is* political and social. He makes no attempt whatsoever to deal with the obvious objection that social and political applications of ethical principles may have to be just as casuistical as any others, and there seems throughout to be a confusion between the *individual* and the *individual's* case.

The important second paper is a careful and (I think) a very valuable attempt to vindicate Mill's *Utilitarianism* from the grosser charges of logical inconclusiveness which are so frequently brought against it. Here Seth's principal arguments are (1) that Mill's 'proof' of Utilitarianism is not an attempt to demonstrate that because each seeks happiness each ought to seek the general happiness. This duty, if it is felt as an obligation, is not *proved* at all but instead is cultivated upon the basis of our

sense of unity with our fellow creatures; and Mill, in his celebrated essay, is only attempting to show that, happiness being the good, the general happiness must be the maximum good; (2) that there is no fatal ambiguity in Mill's use of the term 'desirable' since his argument only requires us to accept the obvious truism that anything which ought to be desired must belong to the class of things which can be desired; (3) that the thoroughly imprecise sense in which Mill uses 'happiness' robs his psychological hedonism of most of the venom which his critics, defining the term in a way that (speaking broadly) was not his, are accustomed to discern in it; (4) that what Seth regards as the fallacy involved in the doctrine of qualitative differences in pleasures means for Mill only that a transcendently important difference in degree becomes a real difference in kind. On the whole Seth's main argument is summed up in the following passage (p. 34): "Hedonism he (Mill) does attempt to prove as we have seen; but having proved that pleasure is the only thing ultimately desirable or good, he seems to think that it follows that the good, and therefore the ethical criterion, is the general happiness, or the greatest happiness, not of the individual, but of the greatest number of individuals. If we would make explicit the ground of this conclusion, which is left implicit by Mill himself, it would be found, I think, in the consideration that, since pleasure is the good, the greater pleasure must, as such, be better than the less, and the greatest happiness of the greatest number (if not of all sentient beings) must therefore be better than the greatest happiness of the individual or of any number of individuals less than the total number. He assumes, as a matter of common sense, what Sidgwick represents as the result of an application of the principle of impartiality or equality—namely, that from the point of view of happiness, which is essentially a quantitative or mathematical whole, each ought to count for one and no one for more than one."

JOHN LAIRD.

The Crisis in Psychology. By HANS DRIESCH. Princeton University Press. 11s. 6d.

Grundprobleme der Psychologie. By HANS DRIESCH. Leipzig: Reinecke. 9.50 M.

The German work is a later version of the American in which Dr. Driesch has collected his Pekin lectures. The American book is less full of matter than the German, and seems to have been badly translated from an earlier German original, part of which is incorporated in the *Grundprobleme*.

There are two aspects of Modern Psychology which Dr. Driesch very properly emphasises as being critical. In the first place analytical psychology—the analysis, as Driesch would say, of "what I consciously have"—is on a more accurate basis, and, secondly, the pattern-making schematic, dynamic-closure tendencies of behaviour are being stressed in opposition to a behaviour dynamic of a 'meaningless' character. It is the latter aspect of the crisis which presents such difficulties. The list of the kinds of things I can 'consciously have' will provide food for quarrels, but when a strictly phenomenalistic attitude is insisted on the critical moment is passed. We shall discover more, we shall pay more respect to what people say they experience, we shall no longer say that images and sensations are of the same nature because we can mistake the one for the other—there can be no such phenomenological mistakes—and the attitude suitable for introspective evidence will have been established.

Driesch analyses the content of consciousness under various headings, in such a way that the '*anschauliche*' material is almost dwarfed by the wealth of '*unanschauliche*' accents of truth, accents of space and time, and accents of '*Bedeutung*'. The first point which he wants to make is that we 'have consciously' and immediately a meaningful variously accented whole. The next point is that what we have before us is as passive as the black and white shadows of a film on a cinema screen. The 'conscious havings' are determined by happenings from without and happenings from within, and the ego 'does' nothing. This lands Driesch in a difficulty later on. He puts too great a gulf between the conscious happenings and the dynamic happenings, and the former get marooned.

We come now to the second crisis—the dynamics of Psychology. We are familiar with the problem—a little more so than Driesch seems to give us credit for when, in the shape of a mechanical formulation of parallelism, he whips a horse so long dead that we should have thought it already a ghost. However, the difficulties have not approached solution. We have behaviour running in patterns, reaching 'ends' which are not mere arbitrary finalities; and what are the laws governing these patterns, what makes behaviour behave? For some unexplained reason, according to Driesch "Nature and mind . . . are absolutely unable to act upon one another in a causal way". This seems to introduce a new crisis, because it seems at first sight so clear that they do. However, a mediator is invented—the entelechy—which can be affected by the body and the dynamic part of the mind. The machinery of behaviour lies behind the scene in an unconscious soul; it consists of determining tendencies, associative tendencies, instinctive tendencies, moral tendencies and so forth. It is excited *via* the entelechy by the outside world and responds according to its nature at the moment. Now, having isolated the conscious 'I,' and pointed out that there are several Egos, conscious, co-conscious, and sub-conscious, attached to the same psycho-physical organism, Driesch makes a curious leap. We find that the conscious mental events are useless. This position is nowhere explained, but we can see what has happened. In order to explain the sequences of thought and behaviour, in pursuit of his '*Ordnungslehre*,' Driesch has invented a '*Ganz ganz-machende Seele*,' and drowned the baby in the bath. By saying that the 'conscious havings' *did* nothing, he thinks we have said that they are merely effects. This seems obviously false, and is not implied by saying that the ego 'does' nothing. If you accept complete determinism and doubt the active ego, you have a set of mental events 'here' and that is all that Driesch seemed to mean, when he said that the ego 'does' nothing. This is compatible with causal relations holding between those events and other events, and it is also compatible with the holding of some other relation necessary for the building up of those peculiar wholes which are bits of behaviour and of which mental events seem to be a vital part. This difficulty prepares us for the chapter on Free Will. If the Soul is all-sufficient, what is the use of the conscious events? Biology says that such an important affair must have some use, and the isolated epi-phenomena, with which Driesch started as 'Ur-phenomene,' can only be saved if the ego be really free. Therefore he suggests that there is a freedom of refusal—a 'Nein-sagens-freiheit'—in the ego. The dynamic soul prepares possibilities of action according to fixed rules, and the ego says 'no' to all except the one it appears to choose; and this refraining from restraining is so negative that he pretends that it is not in conflict with the fai-néant character of the ego which was his second great point. However, "Wir selbst wollen uns nicht entscheiden," he writes. It is the business of Philosophy, as Broad has shown, to sit on the hedge, and tell us where it is dangerous to jump, but

there are degrees in hedge-sitting, and having jumped once or twice into bogs it is irritating to find Driesch so hesitating where the ground looks fairly firm. He dismisses with a wave of the hand the identification of intellectual behaviour patterns with physiological patterns as being too silly, and in defiance of scientific economics he is prepared to invent an unconscious soul which 'knows how to act,' he is certain of a supra-personal soul, and he toys with the idea of a soul which mirrors all things that are going on at any given time.

It is quite true that the cheese-paring method of connecting this isolated mental event with that in causal or associative relationship has made Psychologists miss the wood for the trees; it is quite true that we must introduce some extra relation which holds between mental events and physiological events and other mental events and which they have in virtue of belonging to organic unities of behaviour. We have an analogy in the relation which holds between notes of a tune, and which is referred to by many Psychologists by the word 'meaning'. It is again true that we have no satisfactory account of such a relation, but the atmosphere gets thicker rather than clearer when we let our creative imagination have its way.

W. J. H. SPROTT.

Educational Psychology. By CHARLES FOX. London: Kegan Paul, Trench, Trubner & Co. Pp. ix + 380. 10s. 6d. net.

In this book Mr. Fox has given a useful critical account of certain aspects of recent educational psychology, with the ideas of the Gestalt psychology predominantly in mind; and whatever one may think of the value and reliability or novelty of the Gestalt psychology its importance is undoubtedly such that it is a good thing to have a survey of this kind from one who substantially accepts its main tenets. And this is, as far as I know, the first book by an English writer to treat educational psychology anew from the point of view of the Gestalt psychology.

In Chapter I Mr. Fox discusses some general theories of mind: here in his criticism of the "structural theory" I should have welcomed an expansion of the statement that "psychological dispositions are functional, not primarily structural, and the sole reason for their assumption is to explain as far as may be the functioning of mind". "If we omit the function then structure is perfectly useless," writes Mr. Fox. Most certainly; but is there any objection if, without making assumptions as to the determination of mind by matter, or *vice versa*, we look on the various mental functions as dependent on aspects or elements corresponding to parts in a structural whole; or even in assuming that every mental process has its physiological correlate in the 'structure' known as the nervous system? On page 14 I note that Mr. Fox says that *one* of McDougall's followers, Dr. Maxwell Garnet, thinks that the structure of the mind is but another name for the structure of the nerves. I cannot help thinking that this is not a correct interpretation of Maxwell Garnet; and further I would emphasise the word I have italicised (one) for throughout this book it seems to me that in attacking the structural view of the mind Mr. Fox too frequently identifies that view with a physiological, if not indeed a materialistic one. With Mr. Fox's unsparing censure of crude materialism and associationism as a substitute for genuine psychology I am heartily at one. But I think he too readily sees a materialist lurking beneath a structuralist.

In Chapter III Mr. Fox gives an account of his own interesting experiments on preperception in which the effects of lectures on the parts of a

suit of armour, with their names, is shown in the improved observation of details in pictures of other suits of armour. The most instructive fact here brought out is that when the lecture was brief and the names hardly assimilated, little or no improvement followed; there were in one case even inferior results. Thorough assimilation and a time interval of a week, however, resulted in great improvement. "Lack of terms hindered the mental separation into details." Names formed "pegs on which to hang the detailed observations. Lack of names also led to use of roundabout phrases" which is apt to "turn concentration on the visual image to concentration on the terms expressing it". Another definite result of the specific preparation was that the variability of the different members of the trained group was greatly reduced. But this experiment in preperception hardly justifies Mr. Fox's generalisation that systematic training tends to produce greater uniformity within a group. The opposite has sometimes been found to be the case. In the chapter on Imagery Mr. Fox pours scorn on those who speak of images as "copies of sensations" or "reproductions". But some do get such vivid images, *e.g.*, sound images just after a clock has ceased striking, that distinction from reality is difficult or impossible. For some reason Mr. Fox seems to be roused to anger by persons who differ from him about imagery, and his denunciation of Eidetic imagery investigations, on the ground that he has been present, needs fuller justification; and a sentence on page 85 (following a criticism of Prof. Pear) seems to me incomprehensible; *viz.*, "When I say that I have such an image (kinæsthetic) all I mean is that given the appropriate stimulus I can act in a particular way". The statement (p. 85) that one can plan a garden as well by means of verbal imagery as by visual, makes one think the author has little experience of the value of visual imagery to those in whom it is vivid, and whose testimony he seems to discredit.

In dealing with the question of mental discipline Mr. Fox's practical conclusions are, it seems to me, eminently well balanced. But again in discussing the experimental work bearing on the problem he seems unnecessarily hard on some of those who have tried to analyse the process in which the "transference of training," to use the popular term, takes place. "All reference" he says, "to common elements, factors, and everything of that sort is psychological atavism of a particularly distressful kind." Yet on the previous page he says that the act of attention "is a function common to all mental processes".

Though it will be seen that it seems to the reviewer that Mr. Fox has gone to extremes in criticising atomism in psychology (though there is really very little of such atomism to be found) he has made, I think, a useful contribution in the emphasis of the Gestalt point of view. Not that this is as novel as is sometimes thought. For what seems to be the essential truth in the Gestalt psychology was long ago implied in the work of Ward and Stout, as Mr. Fox, partially at least, has recognised. But Mr. Fox seems at times to accept an extreme statement of the new 'shape' psychology which is inconsistent with other parts of his exposition. One would at times imagine that nothing developed through association. Yet not all progress is mere differentiation of wholes, for Mr. Fox himself states that, in reading, "by practice words become united in unitary complexes which function as wholes". Presumably the true Gestaltist would deny the possibility of building up more complex wholes by the association of simple wholes.

The Gestalt psychology seems to become absurd, however, when it states, as Mr. Fox does, that "each mental phenomenon is what it is only by virtue of its connexion with all the others". Nothing surely can consist entirely in its relation to others.

The discussions of Psycho-analysis, Mental Tests, and Mental Fatigue include many acute comments, and one welcomes, as unusual, a chapter on Æsthetic Appreciation.

It is to be regretted that the mode of giving many valuable references to authorities is so extremely inconvenient.

C. W. V.

L'Année Psychologique. Vingt-cinquième Année. Publiée par HENRI PIÉRON. Pp. xiv + 734. 45 fr.

The present number of *L'Année* contains six original papers, exclusive of an important 'Note' on the scaling of number series tests, in which the writer, Mme. Piéron, attempts to arrange in order of difficulty the different types of number series, and a shorter 'Note' by M. François descriptive of apparatus for the study of thermal sensibility.

The first paper—by Mrs. Ladd Franklin—deals with the present state of the problem of the nature of colour sensations. (*L'état actuel du problème de la nature des sensations de couleurs*). The paper contains little that is new, and is for the most part a repetition of the theory of colour vision associated with the name of Mrs. Ladd Franklin, in language that differs but slightly from that which she has previously used. As before, in answering her critics, she addresses herself chiefly to the task of showing the reasonableness of her theory and the conceivability of the processes she assumes, whereas the really telling criticisms are based on facts of experiment which the theory cannot explain. For example why do typical dichromates match red and green with one another and with grey rather than yellow? Again why do typical dichromates so frequently speak of a reddish-green or greenish-red colour in place of speaking of yellow (see Collins, "Colour Blindness")?

In the second paper, on the part played by rest in mental work (*Le rôle du repos dans le travail mental*), M. Foucault discusses experiments on mental work conducted by him in order to answer two questions raised by a previous research on mental work, described in *L'Année Psychologique*, vol. xx (1914). The first of these questions was whether, if we assume that owing to practice the time required for the adding of a column of digits becomes less because of the acquisition of skill, this acquisition is more or less rapid according as the practice is continuous or broken by intervals of rest. The second question was whether there is an optimal duration of rest interval. With respect to the first question M. Foucault's experiments seem quite conclusive (although one must accept them with some caution because of the complexity of the conditions). He finds that the gain due to practice is greater in proportion as the practice is interrupted by intervals of rest so as to eliminate as nearly as possible all fatigue. As regards the second question he finds—as others have found—that there is an optimal duration of rest interval, and, generalising on the basis of his results, he suggests that for maximal efficiency of work the working time ought to be half the resting period.

In the third paper—*Recherches sur l'établissement de la sensation lumineuse*—M. Kleitman and H. Piéron describe investigations undertaken to study the reactions of the cones and the rods respectively to luminous and chromatic stimuli. By means of Michotte's tachistoscope and an ingenious arrangement of prisms and colour filters they stimulated small macular and extramacular areas of the retina with colourless or coloured light during a given period of time. Their investigations confirm results already obtained by previous workers, and yield also new data. The main conclusions arrived at are these:—

(1) In the establishment of a sensation there is a phase where the point

of equilibrium is passed, and this phenomenon is accelerated as the intensity of excitation is increased, while it is more marked in the case of the rods than in the case of the cones.

(2) The establishment of a luminous sensation is usually more rapid in the rods than in the cones.

(3) With monochromatic light and stimulation only of the cones, red is established most rapidly, and blue most slowly, the other colours at intermediate rates.

(4) White light is still slower in its action than blue, when the cones alone are stimulated.

The authors note that, while (3) is in accord with the Young-Helmholtz theory, (4) is not.

In the paper on *La subduction mentale morbide et les théories psycho-physiologiques* Dr. Maurice Mignard attempts to show how his hypothesis of "morbid mental subduction" can be applied to explain all those phenomena of psychopathology comprised under the term "syndrome of external action". By "morbid mental subduction" he means a state of mind whose normal spontaneity is excessively subjected to the control of certain organic automatisms usually subjected to it. He maintains that the hypothesis of dissociation is unnecessary and invalid, and that the phenomena which have given rise to this hypothesis are really explained in terms of "morbid mental subduction," that is, by the excessive *emprise* exerted on mental spontaneity by the derangement of certain neurological automatisms, normally associated with it, and generally subordinated to it.

The fifth paper on *La sélection psycho-physiologique des machinistes de la Société des Transports en commun de la région parisienne* by J. M. Lahy gives a careful and detailed account of the tests employed to select tramwaymen by the S.T.C.R.P. The tests described are: reaction time, cinematograph test for 'diffused' attention for visual stimuli, and for visual and auditory stimuli combined, test for motor suggestibility, muscular work and fatigability, appreciation of velocities and distances, and emotionality, as tested by the psycho-galvanic response.

In the last paper on *La théorie du contraste simultané, envisagée d'après des recherches sur l'image consécutive indirecte*, St. Velinsky undertakes a discussion critical and experimental of the phenomena of simultaneous contrast, and the various theories that have been propounded to account for these phenomena. The experiments described were for the most part experiments on successive contrast, and were devised in order to decide between the opposing theories of contrast represented by Hering and Fröhlich on the one hand, and McDougall and von Kries on the other, designated the 'complementary' hypothesis and the 'inhibition' hypothesis respectively. As a result of these experiments the following laws appear to be established:—

(1) The indirect excitation is maximal for a brightness of the surface of passive induction equal to that of the surface of active induction.

(2) Increasing saturation of the inducing colour is accompanied by progressive augmentation of the duration of the after-effect up to a certain maximum, which has a value different for the different colours.

(3) The increase of the surface of active induction, or its increase in relation to the surface of passive induction, produces an increase (as an exponential function) of the duration of the after-effect.

The author concludes that simultaneous contrast and after-image are merely two phases of the same energy process. The facts appear therefore to decide in favour of the theories of Hering and Fröhlich.

The usual valuable bibliography of recent psychological literature, filling some 500 pages, occupies the rest of the volume.

J. Derver.

Einführung in die Phänomenologie. By Dr. Wilhelm Reyer. Leipzig: Felix Meiner, 1926. Pp. x + 465. 12.50 R.M.

There are few philosophical movements in Germany more prominent at the present time than the one which expresses itself under the name of "phenomenology," and there can be no two opinions as to the need of a clear and fairly simple introduction to that type of thought. This the present book is intended to supply. It is certainly a sound piece of work and will be useful for its purpose, but I must admit a slight feeling of disappointment. One cannot help asking whether, if "phenomenology" simply means what is expounded here, it is anything so important and so revolutionary as is often held. Nor is the effect of the book enhanced by the seemingly excessive amount of repetition and the dogmatic statement of the argument. It would no doubt have been undesirable to fill a book like this mainly with direct controversy, but surely it is a mistake of method to pay no explicit attention at all to the views of modern opponents, hardly one of whom is so much as mentioned, though the author rightly devotes some criticism to Kant and to the empirical sensationalists in general. The book comes too near being merely didactic and is too little concerned to give an account of the reasons for the views maintained.

The author is at his strongest in the issue between representationism and direct knowledge in the purely epistemological plane. The theory of knowledge put forward is in many respects similar to that of "Critical Realism". The mind knows through ideas, but ideas are not the primary *object* of knowledge, only the means by which we cognise reality. The essential feature of cognition is an act of "Intention" directed towards reality in which we use our ideas to *mean* something in reality, and the whole character and function of ideas is dependent on this reference to a reality that is other than our ideas. The function of "phenomenology" is to study the nature of the acts of cognition and from this to proceed to the understanding of universals and "structures," a transition which might have been made clearer. The objects of knowledge are the essences, or concrete structures of qualities, that make up the things given to us by experience and thought. These essences may be considered in abstraction from their realisation in any particular part of space and time, and in any case our most important task from the point of view maintained in the book is to grasp their character as systems. Their dominating category is a necessary connexion closer and more intimate than that provided by external relations or even by causality, for such a close connexion is required to bind together qualities in one object and constitute thinghood. Kant's "theory" of knowledge is rejected but his "critique" of knowledge is accepted, *i.e.*, it is held that he was right in declaring that the mind must follow the categories and in making nature conform to the categories, wrong in therefore making nature the product of our minds and the object identical with the content of knowledge.

One would like to know how the author thinks phenomenology hopes to avoid the current objections against a philosophy which derives its view of reality from the nature of the knowing act as such. Does the account of knowing really give us much valuable information except by bringing in the objects known, and, if not, as the author himself seems to admit implicitly, what makes phenomenology so essentially different from the sciences and the kinds of philosophical thought which deal with the general nature of the objects known? The idea of a system of concepts abstracted from reality, the place of each of which is fixed definitely by logic, would no doubt meet with much opposition, especially as the author includes in this system not only universals but individual concepts, like

the Prussian state under Frederick the Great. There seems to be an urgent need for a fuller and clearer account of the relation between universals and particulars. On the other hand, in its recognition of the importance of necessary connexion, in its use of the method of analysis and in its attempt to reconcile the direct and the representative views of knowledge, "phenomenology" as here expounded certainly does make a valuable contribution to philosophy.

A. C. Ewing.

La Philosophie de Kant. Cours de M. Émile Boutroux, Professé a la Sorbonne en 1896-97. Paris: Librairie Philosophique, J. Vrin, 1926. Pp. 374.

Immanuel Kant: Kritik der reinen Vernunft. Neu Herausgegeben von Raymund Schmidt. Leipzig: Verlag von Felix Meiner, 1926. M. 8.

M. Boutroux's lectures on Kant, delivered at the Sorbonne in 1896-97, were first published in the *Revue des Cours et Conférences* for the years 1894-96 and 1900-01, from notes taken by one of his hearers. This text has now been revised by M. Étienne Gilson; and is issued in this new form under a title which is somewhat more comprehensive than the contents quite justify. The first three-quarters of the volume are devoted to the *Critique of Pure Reason*, and the remainder to the *Metaphysic of Ethics* and the *Critique of Practical Reason*. The *Critique of Judgment* is not dealt with. The lectures are both expository and critical; and indeed are of very considerable interest as a statement of M. Boutroux's own philosophical standpoint. He is careful, however, to keep the exposition and the criticism unmistakably apart; and as an introduction to Kant's Philosophy, the volume can be very warmly recommended to English readers. While the lectures have some of the defects inevitable in writing specially prepared for oral delivery, I know none of M. Boutroux's works in which his powers of lucid exposition are more notably shown. The issues are highly simplified; but this is done very skilfully, without undue sacrifice of essentials, and always in a very scholarly and thoroughly informed manner. If no account has been taken of the more recent contributions of Vaihinger and Adickes, and if the *Critique of Pure Reason* is therefore treated as a unitary work, this also is perhaps advisable for those making a first study of the Critical Philosophy.

Dr. Raymund Schmidt's new edition of the *Critique of Pure Reason*, under the auspices of the Philosophische Bibliothek, is a very elaborate recasting of the previous editions of v. Kirchmann and Valentiner. It incorporates all the more or less definitive results reached in the past half-century in study of the text. The variations in the first and second editions are given on the same page, or failing this on opposite pages, and alternative readings, suggested by successive editors or by commentators, at the foot of each page. Kant's punctuation has been retained throughout, on the ground that even when open to obvious objections, it serves as a clue to the manner in which sentences, written independently and at different times, have been run into one another, not infrequently in violation of the rules of good grammar. It does not, of course, form any part of Dr. Schmidt's programme to enter upon those venturesome and conjectural analyses of the text through which Vaihinger and Adickes have cast so much light upon the development of Kant's views; but with this sole limitation Dr. Schmidt's edition meets every possible need of the more advanced student of the *Critique*.

N. K. S.

Deutsche Wertphilosophie der Gegenwart. By AUGUST MESSER. Emmanuel Reinicke. Leipzig, 1926. Pp. iv, 260.

The bulk of this book is composed of careful and lucid summaries of four recent German theories of value, those of Max Scheler, Heinrich Rickert, Hugo Münsterberg, and William Stern. The first is taken as representative of 'phenomenological,' the second of idealistic, the third of idealistic-realistic, the fourth of realistic theories of value, and a short introduction and thirty pages of 'critical appreciation,' complete a volume which will be found useful as a conspectus of present German speculation on the important subject of values. Prof. Messer gives a good idea of the elaborate developments of which systems of 'Wertphilosophie' have been found susceptible and of the success with which, in words at least, claims to 'a priority' and 'objectivity' have been sustained on their behalf; but one is left with an impression that the psychological basis of this method of philosophising, in the distinctive experiences of the various values and acts of valuation, and in an inductive investigation of their actual occurrence and use, has hardly been sufficiently explored or taken into account. Nor again do the German theorists appear to have fully considered the logical implications of the complex interactions of judgments of 'fact' and judgments of 'value' and the curious ways in which 'facts' arise out of and become 'values,' and 'values' become and create 'facts'. The absolute antithesis of 'fact' and 'value' can hardly be maintained in view of such considerations, but it is evident that opinions will long continue to be divided on the question whether the category of fact should take precedence in philosophy over that of value, or *vice versa*.

F. C. S. SCHILLER.

The Works of Aristotle translated into English. Categoriae and de Interpretatione. By E. M. EDGHILL. *Analytica Priora.* By A. J. JENKINSON. *Analytica Posteriora.* By G. R. G. MURE. Oxford: Clarendon Press, 1926.

At last we have the volume some of us have so long felt the need of, a thoroughly scholarly translation of Aristotle's *Analytics*, with the tracts on the categories and the forms of proposition which they presuppose, accompanied by brief but sufficient running notes on the chief difficulties of text and interpretation. Full use appears to have been made of the obviously necessary helps, Waitz, H. Maier, Bonitz, and others; though it is perhaps singular that Mr. Jenkinson is the only one of the three translators who makes any explicit acknowledgement to the one author who has done more for the understanding of the *Organon* than any man of later times, Pacius, though this may, no doubt, be due simply to the fact that his assistance is more constantly required in the *Prior Analytics* than in any other part of the treatises before us. For a really satisfactory treatment of the very tiresome doctrine of "modal" propositions and their oppositions, it might have been necessary for Miss Edghill to have gone back beyond Pacius to the scholastics, as I do not gather that she has done. But after all, the translator is doing more than can be demanded when he volunteers also to act as commentator. And all through, the demands which can be fairly made on a translator have been more than met. The version does the utmost credit to its authors and to the scholars who, like Mr. W. D. Ross, Mr. J. A. Smith, and Mr. Joachim, have lent their generous aid. Those of us who can remember the teaching of the late Prof. J. Cook Wilson will understand how great a benefit it is that

notes on his lectures on the *Posterior Analytics* should have been available to Mr. Mure. One can only thank everyone concerned in the production of the volume and hope that we may soon have an equally excellent version of the more entertaining *Topics*. May one once more press, even out of season, for a speedy issue of the badly needed version of the *Physics*?

A. E. T.

Old and New Viewpoints in Psychology. By KNIGHT DUNLAP, Professor of Experimental Psychology in the Johns Hopkins University. London: Henry Kimpton, 1925. Pp. 166.

In the five essays of which this volume is composed Prof. Knight Dunlap appears to be writing for the general public whilst inwardly preoccupied with the domestic problems of his science. In the first chapter the distinctions and the relations between experimental psychology and mental testing are explained, and certain misconceptions on the subject combated. The second chapter reviews some of the more important schools of contemporary psychological thought. In the third chapter the author is concerned to press home the obvious sources of unreliability in the evidences for spiritualism, in the fourth to present a conservative and orthodox account of the psychology of the comic, and in the last to warn us against the fraudulent systems of the "character analysts" who prey upon business and industrial organisations in the United States. On all these subjects the author speaks with clarity, caution, and common sense. He is obviously distressed by the exaggeration and quackery with which psychology has become infected in the years of its recent popularity, and his energetic resistance to these evils deserves all sympathy and success. Perhaps the general reader will find most of Prof. Dunlap's conclusions somewhat tame whilst the student will find them trite. But everyone should enjoy his exposition and criticism of present day schools of psychological thought. This is a very readable chapter. The author is acute and witty in his observations and the reader is carried on to the end of the book expecting to find other passages as good.

C. A. MACE.

Personality and Reality: A Proof of the Reality of a Supreme Self in the Universe. By J. E. TURNER, M.A., Ph.D. London: George Allen & Unwin, Ltd., 1926. Pp. 190.

This is an easier book to read than the author's *A Theory of Direct Realism;* the argument is developed steadily and is not overloaded with controversy and the exposition of rival doctrines—a serious defect in his other book. A certain obscurity in his fundamental conceptions remains, but it is an obscurity that he shares with all other writers of his school. This is especially obvious in his use of "transcendence" and the "transcendence of Time".

From the standpoint of his "Direct Realism" Mr. Turner investigates the relation of Mind to its Material environment. He asserts his acceptance of the "facts of Materialism" and the "principle of Evolution" and on this basis proceeds to an examination of the nature of mechanism. His conclusion is that mechanism is possible only if it be dominated by a constructive or creative mind. The main steps in his argument seem to be as follows. The Universe is characterised by definiteness of structure, complexity of organisation, and plasticity of response; these characteristics imply an "unbroken continuity" underlying which is an "incessant

dynamic activity". These are also the characteristics of mind; anything which possesses these characteristics must, it is urged, be a system (chs. i-iv). Mind, then, is a system. In determining the characteristics of the Self, Mr. Turner takes into consideration the facts of art and artistic creation. This, it may be noted in passing, is welcome; too many recent writers have dealt with the problem as to the nature of mind without finding it necessary even to refer to these characteristically mental activities; one gathers the impression from such writers that the whole function of mind is to perceive and remember "tables" or "pink rats". But while it is true that art reveals mind and that such revelation cannot be neglected, it does not follow that mind is exclusively or adequately revealed in art any more than that it is exclusively revealed in sense-perception. Mr. Turner does not fall into either of these extremes, nor does his argument pass directly from the characteristics of a work of art to the characteristics of the Universe. It is rather the notion of *system* that he finds peculiarly attractive.

Mr. Turner holds that Hume's analysis of the self has clearly established that the self cannot be simple; but he argues that it may nevertheless be a *unity* such that mind is expressed through, and is dependent upon, the "inherent nature" of its elements. That is to say, the structure is what it is because the elements are what they are. He illustrates this unity by the somewhat startling comparison of the self to the British Cabinet (p. 83). He is concerned to maintain that the characteristics of the self are in no sense peculiar, and that since they are "shared by all other reals, it must follow that the development of personality is closely related to that of reality as a whole" (p. 67). But, like the British Cabinet, the self is "dominant"; it is an "essentially *dominant* system," and its evolution consists in its increasing dominance of the environment (ch. v). This conception of *dominance* is central to Mr. Turner's argument. It is through it that he attempts first to deal with the problem whether the self is substantival or adjectival, and secondly to establish the existence of a supreme and, therefore dominant, self (ch. vi). With regard to the first problem, the main points seem to be that the self as such must be individually immortal, essentially connected with the whole, and also self-determining. Since, however, Reality transcends Time, "immortality" does not involve "mere temporal continuance". Mr. Turner's exposition here suffers from the obscurity in which he left his "Realist Theory of Time" in his earlier volume. The next step is to relate the finite self to (*i*) Mechanism; (*ii*) the Absolute, and thus to pass to the Supreme Self (chs. vii-ix). The essence of mechanism consists in the ordered arrangement of the parts, not in the manufacture of the constituents. This arrangement expresses the activity of mind. Complex mechanisms are constituted by mind; and, the more complex and perfect the mechanism, the more adequately can it replace mind, since it thereby becomes "automatic" or "self-acting"; hence, the more difficult would it be for a mind of a lower level to realise that the mechanism must have been constructed by mind. It is then argued that the Universe is a mechanism of the greatest complexity and definiteness of structure, indestructible yet plastic; it is thus a mechanism which achieves the ideal of being self-maintaining. Such a mechanism must be dominated by a mind which is a supreme self. In the concluding chapters Mr. Turner, dealing briefly with the relation of the supreme self to the Absolute, and with the relation of Mechanism to Beauty, insists that the supreme self does not control the mechanism as a chauffeur his car; rather is the supreme self transcendent and the machine is self-evolving, self-maintaining. But the original activity was that of creation. The final obscu ity of the argument can be indicated by a quotation: "Creation is thus the primal action or influence

of the supreme self upon the self-evolving material universe, which, simply because it is self-*evolving*, is the manifestation of this self as immanent; as such therefore, creation is real, unique, but in the end incomprehensible" (p. 182).

There is an obvious resemblance between this theory and the old-fashioned "argument from design". Mr. Turner is, however, justified in claiming that there is an important difference between the two arguments, since his is based upon the view that mind *must* express *itself* through the dominance of mechanism, whereas the older view assumed a mind to *explain* a machine. Hence, Mr. Turner's theory has nothing to fear from evolution. Nevertheless, the theory rests upon enormous assumptions, namely that the Universe is an ordered whole, that it is "self-determining," that mind is fundamentally different from matter, and that a supreme mind can be related to the whole as a mechanic to his machine. Those who share Mr. Turner's initial presuppositions will find his theory interesting; those who do not are not likely to find his "proof" convincing.

L. S. S.

Received also:—

O. Dittrich, *Geschichte der Ethik*, 3 vols. (Bd. I, Altertum bis zum Hellenismus; Bd. II, Vom Hellenismus bis zum Ausgang des Altertums; Bd. III, Mittelalter bis zur Kirchenreformation), Leipzig, F. Meiner, 1926, pp. viii + 374, vii + 311, viii + 511, M. 15, 12, 20.

J. Ward, *Psychology applied to Education*, Cambridge University Press, 1926, pp. xiii + 188, 10s. 6d.

J. C. Smuts, *Holism and Evolution*, London, Macmillan and Co. Ltd., 1926, pp. vii + 361, 18s.

L. T. Hobhouse, *Mind in Evolution*, 3rd Edition, London, Macmillan & Co. Ltd., 1926, pp. xix + 483, 12s. 6d.

T. Whittaker, *The Metaphysics of Evolution, with other Essays*, London, Williams & Norgate Ltd., 1926, pp. viii + 480, 16s.

The Nature of Ideas (University of California Publications in Philosophy, Vol. VIII), Berkeley, California, University of California Press, 1926, pp. 213, $2.75.

P. Choisnard, *La Chaîne des Harmonies*, 2e édition, revue et augmentée, Paris, E. Leroux, 1926, pp. 219, 15 fr.

G. Rensi, *Lo Scetticismo*, Milan, Edizioni Athena, 1926, pp. 106, L. 5.

R. T. Flewelling, *Creative Personality*, New York, Macmillan Co., 1926, pp. 320, $2.50.

G. A. Wilson, *The Self and its World*, New York, Macmillan Co., 1926, pp. x + 383, $2.20.

R. Arch, *Whence, Whither, and Why?* London, Watts & Co., 1926, pp. 105, 3s. 6d.

C. E. M. Joad and J. Strachey, *After-Dinner Philosophy*, London, G. Routledge & Sons Ltd., 1926, x + 137, 3s. 6d.

A. Wolf, *Essentials of Logic*, London, G. Allen & Unwin Ltd., 1926, pp. 146, 5s. 6d.

A. Wolf, *Key to Exercises in Logic and Scientific Method*, London, G. Allen and Unwin Ltd., 1926, pp. 154, 5s.

G. N. Lewis, *The Anatomy of Science*, New Haven, Yale University Press (London, H. Milford), 1926, pp. ix + 219, 14s.

H. Buchholz, *Das Problem der Kontinuität; Die Unmöglichkeit absoluter metrischer Präzision* (Grenzfragen der Philosophie, Heft 1), München, C. H. Beck, 1927, pp. 133, M. 7.50.

A. F. Bentley, *Relativity in Man and Society*, New York, G. P. Putnam's Sons, 1926, pp. ix + 363.

W. E. Hocking, *Man and the State*, New Haven, Yale University Press (London, H. Milford), 1926, pp. xv + 463, 18s. 6d.

W. E. Hocking, *The Present Status of the Philosophy of Law and of Rights*, New Haven, Yale University Press (London, H. Milford), 1926, pp. viii + 97, $2.00, 9s.

G. E. G. Catlin, *The Science and Method of Politics*, London, Kegan Paul, Trench, Trubner & Co. Ltd., 1927, pp. xii + 360, 12s. 6d.

R. B. Perry, *General Theory of Value*, London, Longmans, Green & Co., 1926, pp. xvii + 702, 25s.

W. Fite, *An Adventure in Moral Philosophy*, London, Methuen & Co. Ltd., 1926, pp. x + 276, 10s. 6d.

I. C. Isbyam, *The Self-Seeker and His Search*, London, C. W. Daniel Co., 1926, pp. xiii + 128, 5s.

C. W. Margold, *Sex Freedom and Social Control*, Chicago, University of Chicago Press, pp. ix + 143, $2.00.

P. R. Hamui, *Lineamenti d'Estetica*, Aleppo, G. Agiami, 1926, pp. viii + 87.

J. Wahl, *Étude sur le Parménide de Platon*, Paris, F. Rieder & Cie, 1926, pp. 276, 20 fr.

J. Rahder, *Daś-abhūmikasūtra et Bodhis-attvabhūmi*, avec une Introduction et des Notes, Paris, P. Geuthner, 1926, pp. xxviii + 99 + 28.

J. Rahder, *Daś-abhūmika-Sūtram* (Ex Actorum Orientalium Vol. IV excerptum).

A. D. Nock, *Sallustius concerning the Gods and the Universe*, Cambridge University Press, 1926, pp. cxxiii + 48, 12s. 6d.

M. Zepf, *Augustins Confessiones*, Tübingen, J. B. C. Mohr, 1926, pp. 105, M. 4.20.

W. Lang, *Das Traumbuch des Synesius von Kyrene*, Tübingen, J. B. C. Mohr, 1926, pp. 91, M. 3.60.

Opera hactenus inedita Rogeri Baconi: Fasc. VII, Questiones supra Undecimum Prime Philosophie Aristotelis, ed. R. Steele, Oxford, Clarendon Press, 1926, pp. xii + 160, 10s. 6d.

M. de Wulf, *History of Mediaeval Philosophy*, Vol. II (new edition in two volumes), trans. by E. C. Messenger, London, Longmans, Green & Co. Ltd., 1926, pp. xii + 336, 12s. 6d.

W. Frost, *Bacon und die Naturphilosophie*, Munich, E. Reinhardt, 1927, pp. 504, M. 10.

C. D. Broad, *The Philosophy of Francis Bacon*, Cambridge University Press, 1926, pp. 67, 2s. 6d.

F. J. C. Hearnshaw (edited by), *Social and Political Ideas of Some Great Thinkers of the XVIth and XVIIth Centuries*, London, G. G. Harrap & Co. Ltd., 1926, pp. 220, 7s. 6d.

A. J. Snow, *Matter and Gravity in Newton's Physical Philosophy*, London, H. Milford, 1926, pp. 256, 7s. 6d.

C. C. J. Webb, *Kant's Philosophy of Religion*, Oxford, Clarendon Press, 1926, pp. 218, 12s. 6d.

E. G. Braham, *Personality and Immortality in Post-Kantian Thought*, London, G. Allen & Unwin Ltd., 1926, pp. 246, 7s. 6d.

T. Lipps, *Psychological Studies*, Second Edition, trans. by H. C. Sanborn (Psychology Classics, Vol. II), London, Baillière, Tindall & Cox, 1926, pp. 333, 27s.

M. Drummond and S. H. Mellone, *Elements of Psychology*, Sixth Edition Revised, Edinburgh, W. Blackwood & Sons Ltd., 1926, pp. xix + 552, 10s. 6d.

E. S. Robinson, *Practical Psychology*, New York, Macmillan Co., 1926, pp. xii + 479, 7s. 6d.

J. de la Vaissière, *Elements of Experimental Psychology*, trans. from fifth French edition by S. A. Raemers, London, B. Herder, 1926, pp. lvi + 438, 12s.

M. Collins and J. Drever, *A First Laboratory Guide in Psychology*, London, Methuen & Co. Ltd., 1926, pp. 108, 5s.

C. J. Patten, *The Memory Factor in Biology*, London, Baillière, Tindall & Cox, 1926, pp. xiii + 175, 5s.

W. H. R. Rivers, *Psychology and Ethnology*, London, Kegan Paul, Trench, Trubner & Co. Ltd., 1926, pp. xxviii + 324, 15s.

M. Sternberg, *Die Bedeutung der scholastischen Philosophie für das heutige medizinische Denken*, Berlin, Gebr. Borntraeger, 1926, pp. 22, M. 1.80.

S. G. Dimond, *The Psychology of the Methodist Revival*, London, H. Milford, 1926, pp. xiv + 296, 10s. 6d.

S. L. Pressey and L. C. Pressey, *Mental Abnormality and Deficiency*, London, G. Allen & Unwin Ltd. (no date), pp. xii + 356, 10s. 6d.

L'Assistenza dei Minorenni Anormali, Bollettino dell' Opera "Scuola Magistrale Ortofrenica di Roma," Rome, October, 1926, pp. 147.

E. Miller, *Types of Mind and Body*, London, Kegan Paul, Trench, Trubner & Co. Ltd., 1926, pp. 132, 2s. 6d.

M. Sturt and E. C. Oakden, *Modern Psychology and Education*, London, Kegan Paul, Trench, Trubner & Co. Ltd., 1926, pp. xxiv + 320, 7s. 6d.

T. Ziehen, *Das Seelenleben der Jugendlichen*, Langensalza, H. Beyer & Söhne, 1927, pp. 110, M. 2.20.

S. D. Schmalhansen, *Humanizing Education*, New York, New Education Publishing Co., 1926, pp. 343.

M. Maresca, *Il problema della scienza e l'educazione*, Milan, Albrighi, Segati & C., 1926, pp. viii + 188, L. 6.50.

H. Weinreich, *Die sokratische Methode und wir Mathematiker*, Berlin, O. Salle, 1926, pp. vi + 50, M. 2.20.

W. H. Burnham, *Great Teachers and Mental Health*, London, D. Appleton & Co., 1926, pp. xiii + 351, 8s. 6d.

J. Huxley, *Essays in Popular Science*, London, Chatto & Windus, 1926, pp. xi + 307, 16s.

T. O'Hagan, *The Genesis of Christian Art*, New York, Macmillan Co., 1926, pp. 170, 6s. 6d.

VII.—PHILOSOPHICAL PERIODICALS.

PROCEEDINGS OF THE ARISTOTELIAN SOCIETY, 1925-1926. N.S., Vol. xxvi. **J. A. Smith.** Presidential Address: 'The Issue between Monism and Pluralism.' [The issue is represented as one which can neither be evaded nor compromised. "There is no half-way house between saying that the whole is as multiple as it appears to be, and that it is not multiple at all." Prof. Smith's own decision is apparently in favour of a sheer monism which wholly "excludes multeity or multitudinousness". Experience with its multiplicity, variation, etc., must therefore be wholly unreal. "From this dread apocalypse or revelation of the unreality of all matters of experience I am now convinced that there is no escape by way of the doctrine of degrees of truth or reality." The division of the Absolute into finite centres is not merely "inexplicable," as Bradley says, but "repugnant and objectionable". Nevertheless Prof. Smith firmly believes "that there is a good plea . . . for Pluralism," and wants to see some one "undertake the defence of what is this-here-now-mine," who, undertaking it, "will engage never to compromise or give it away in detail". The reader is left to reconcile these utterances as best he can, except for a recommendation to seek further light from a study of Croce, between whom and Gentile it is "that the lists are set".] **L. A. Reid.** 'The Nature of Beauty.' [Analyses the æsthetic experience, and then discusses the nature of beauty, which is held to belong not to the physical object but to "the synthesis of present sensuous mental experiences enriched by fused associations with the past".] **C. R. Morris.** 'Judgment as the Fundamental Act in Knowledge.' [Maintains that "the only kinds of judgment which logic may properly study are judgments asserting necessary connection," and regards this view as following from the Kantian theory of knowledge. The everyday judgments of casual perception are not genuine judgments at all, nor are historical judgments, unless they can be taken as asserting necessary connections.] **J. L. Stocks.** 'The Unity of Thought.' [The contents of this paper may be most easily indicated by saying that it deals with the difficult question discussed by Bosanquet in the first chapter of his *Logic* under the heading 'Judgment in relation to time'. The paper is no doubt on right lines, but seems hardly to recognise sufficiently the difficulty raised by the logically timeless aspect of the judgment.] **C. A. Richardson.** 'Time and its relation to Unconsciousness.' [Takes up the position that each individual experience has its own private time, and deduces various more or less questionable consequences.] **F. W. Thomas.** 'Existence and Conventional Existence.' [Characterised by the author himself as "some reflections, disjointed, it is to be feared, and inconclusive, of a logico-psychological character".] **G. C. Field.** 'Ancient Philosophy and Modern Science.' [A clear and interesting paper, the main object of which is to show the debt which modern science owes to the philosophical thinkers of the sixteenth and seventeenth centuries and through them to Greek philosophy.] **R. G. Collingwood.** 'Some Perplexities about

Time: with an attempted solution.' [The writer's concern is "to justify our ordinary view of time," but the trouble is that this view contains contradictory elements. After stating the difficulties involved in it, he argues, on the one hand, that the past and the future are not real (but seems here to beg the question by identifying reality with present existence), and admits as a consequence that "we cannot really know the past and the future". On the other hand, he recognises that, if this were the whole truth, the present itself would vanish, being left without any determination or content. Hence we must "*in some sense* . . . restore to the past and future their actuality". The suggested solution is indicated in the following sentence: "The past *as past* and the future *as future* do not exist at all, but are purely ideal; the past as living in the present and the future as germinating in the present are wholly real and indeed are just the present itself".] **G. D. H. Cole.** 'Loyalties.' ["An attempt to develop the line of thought" of a previous paper on 'Conflicting Social Obligations'. The main contention is summed up thus: "Rational loyalty to the whole is what we want; but that is to be achieved only through a harmony of diversified loyalties to the parts". But loyalty to the whole is by no means to be identified with loyalty to the State. To do this is the error of the "metaphysicians" and "Hegelians". If Bosanquet is to be taken as a type of such thinkers, Mr. Cole's language about them seems neither consistent nor accurate.] **I. Levine.** 'Naturalism and Values.' ["Naturalism does not in any sense destroy value; it ignores it." Yet on an earlier page the writer seems to say that a naturalistic account of value can be and has been given.] **C. D. Broad.** 'Kant's first and second Analogies of Experience.' [Kant has seen the importance of the questions involved in our knowledge of an objective time-order of events, but his argumentation is confused and unsatisfactory. Dr. Broad's criticism is not of the sympathetic order.] **A. E. Heath.** 'Objectivity in Science.' ["The character of impersonality is an essential to science."] **G. Dawes Hicks, J. Drever,** and **J. A. Smith.** Symposium: 'Is the Mind a Compound Substance?' [Prof. Dawes Hicks gives a searching criticism of Broad's theory of mind as a compound of a bodily and a psychic factor. Dr. Drever and Prof. Smith agree in general with this criticism, and the former questions whether mind is to be regarded as a substance at all.] **C. Delisle Burns.** 'The Activity of Mind.' [Discusses the characteristics of mental process as observable in art, social co-operation, etc. Philosophers have given too exclusive an importance to science.] **F. H. Cecil Brock.** 'Implications of the Philosophy of Bergson.' [An interesting attempt to develop the implications of Bergson's philosophy as a philosophy, not merely or primarily of change or of vitalism, but of freedom.]

ARISTOTELIAN SOCIETY, SUPPLEMENTARY VOLUME vi, 1926, "METHODS OF ANALYSIS". **H. W. B. Joseph, F. P. Ramsey,** and **R. B. Braithwaite.** Symposium: 'Universals and the "Method of Analysis".' [Mr. Joseph's paper is primarily a criticism of an article by Mr. Ramsey in MIND, in which the distinction between universals and particulars was called in question, but in the course of it he is led to make some wider criticisms on the logic of the school to which Mr. Ramsey belongs. Readers who do not belong to this school are likely to be in cordial sympathy with the general drift of the paper. Mr. Ramsey thinks that Mr. Joseph has not fully understood the article criticised or the doctrines of the school; whether this is so or not, it seems plain that in some of his own criticisms he has failed to understand Mr. Joseph's argument. Mr. Braithwaite is not prepared to maintain that the distinction between

universals and particulars is ultimate, but disagrees with Mr. Ramsey's analysis of the difference between them, and takes the distinction to be an objective one and to depend on this, that "the particular occurrence is unique in space and time . . . whereas a universal has no such unique relation to space and time".] **E. S. Russell, C. R. Morris,** and **Sir W. Leslie MacKenzie.** Symposium: 'The Notion of Emergence.' [Dr. Russell in an admirably clear paper argues that a merely negative Emergent Vitalism can offer no solid opposition to the Mechanical Theory of Life, and that it is only when we connect the irreducible character of distinctively vital processes with the operation of mind that we get a positive basis for the rejection of the mechanical theory. Mr. Morris rejects the notion of Emergence altogether, but somewhat too easily, since he regards mechanical explanation as identical with the recognition of necessary connexion, and emergence as identical with the denial of such connexion. Sir W. Leslie Mackenzie devotes the larger part of his paper to a useful examination of the meaning of emergence, and concludes "that the best use of the term is to name provisionally cases where causation is accepted as a fact, but where the steps of their production are not yet capable of scientific description". He adds a paragraph on Dr. Russell's paper and asks how the psychological interpretation is related (positively) to the physics and chemistry of the organism.] **J. L. Stocks, C. D. Broad,** and **W. G. de Burgh.** Symposium: 'The Validity of the Belief in a Personal God.' [After some preliminary discussion Prof. Stocks formulates the question for discussion as "whether a personal God is a necessary or allowable feature in a (philosophical) *Weltanschauung*". He then discusses what is implied in the religious requirement of a personal God, and indicates the kind of metaphysic which is capable of 'honouring the religious demand'. Dr. Broad's main contention is that, while religious emotion may guarantee the *existence* of the beliefs that are its causes or effects, it cannot guarantee their *truth;* and he prepares the way for this contention by analysing with rather tedious elaboration the emotional situation in general and the causal relations of emotion and belief. As criticism of the previous paper all this seems wide of the mark, for Prof. Stocks had expressly refused to identify the religious experience with emotion—Dr. Broad himself refers to the statement—and had also expressly said that he *assumed* the religious experience not to be illusory. Prof. de Burgh calls attention to the undue stress laid by Dr. Broad on "the emotional situation" and maintains that "the cognitive factor," the vision or awareness of the presence of God, determines the question of validity. "The business of philosophy is to elicit the implications of religious experience and to bring it to a clearer consciousness of itself, and, further, to discover in what form it can best be harmonised with the rest of our knowledge." One would have thought that the first of these tasks, at any rate, belonged rather to the theologian.] **L. T. Hobhouse, J. A. Smith,** and **G. C. Field.** Symposium: 'The Place of Mind in Nature.' [Prof. Hobhouse first explains what he takes to be the distinctive characteristic of mind, *viz.* its activity of correlation and, more especially, purposive correlation, and then argues that such correlation seems to be lacking in inorganic structures and even in organisms as regards many of their operations. He concludes by indicating the metaphysical conception of a conditioned teleology to which such considerations have led him. Prof. Smith's short contribution does not advance the discussion much, since it does little more than suggest a metaphysical doctrine that mind is all-pervasive and that we have an understanding of what mind is that (in some sense) is not derived from experience. Prof. Field's paper continues the discussion on the lines of the opening paper, and argues (1) that in order to define mind we must add to correlation the fact of

consciousness, *i.e.* that the elements correlated are conscious elements, (2) that it is not clear that vital processes must be either mechanical or else the work of mind: "why should not Life be an emergent characteristic intermediate between mechanism and Mind?"]. **G. Dawes Hicks, H. H. Price, G. E. Moore,** and **L. S. Stebbing.** Symposium: 'The Nature of Sensible Appearances.' [Prof. Dawes Hicks's paper gives a careful account and criticism of Broad's theory of sensa. Mr. Price seeks to show that the facts about sense qualities are best explained by the natural view that we apprehend the physical thing itself, and examines the facts alleged against this view. Prof. Moore is in general agreement with Broad against the two previous writers. Miss Stebbing's paper deals first with the difficulties of Broad's latest exposition, and then with his criticism of the Multiple Inherence theory as directed against Whitehead. A fundamental criticism by Prof. Dawes Hicks is that Broad seems to hold two inconsistent views. "Dr. Broad is constantly writing as though he meant that in perception we somehow break through the circle of sensa and directly apprehend physical objects. On the other hand, when we come to closer quarters with the matter, we find that, according to the sensum theory, the things which we do intuitively apprehend consist exclusively of 'series of correlated sensa'." The criticism seems to apply also to Prof. Moore who regards it as possible to hold that "we are never in any case of perception whatever directly aware of any physical object at all or any part of one" and at the same time that we *perceive* physical objects though indirectly. Prof. Dawes Hicks says he does not see "in what way sensa, interpreted as the theory requires them to be interpreted, could so much as indicate to us the bare *existence*" of "the physical entities" of Broad's theory. Prof. Moore replies that Broad has done his best to show how our knowledge of physical objects is derived. But it should be added that Broad has to postulate "an innate principle of interpretation which we apply to the data of sense-perception".]

Revue Néo-Scolastique de Philosophie. 28e Année. Deuxième série, No. 11, August, 1926. **J. Leclerq.** *Note sur la justice.* [A preliminary extract from a forthcoming work, *Traité de Droit naturel.* Most contemporary discussions of justice suffer from the lack of a clear definition of the term. In mediæval philosophy justice is commonly defined as the virtue by which we render to every one his rights. A man's right is to fill his place in the universal order. Hence no definite sense can be put on the definition unless we have a clear conception of this order. It is important to distinguish "commutative" from "universal" justice. "Commutative" justice regulates relations between individuals and secures peace between them. "Universal" justice has a further end, reciprocal aid and co-operation in realising the *common* good, which is the social end. The current opposition of "justice" and "charity" only holds good so long as we consider "commutative" justice. "Universal" justice is simply charity considered apart from its foundation in the love of God. Or we may say that charity, in the strict sense, is the supernatural completion by grace of "universal" justice. Thus if it is asked whether an employer is obliged in justice to pay a higher wage to an employee with a family than to a celibate, the answer is no, if we are referring to the obligations of "commutative" justice. If by justice we mean "universal" justice, the answer would be, yes, *if* this is really the most satisfactory way in which the employer can promote the "common" social good.] **O. Lottin.** *La "Summa Sententiarum," est-elle postérieure aux sentences de Pierre Lombard?* [The *Summa Sententiarum* has commonly been thought the earlier work on the ground of its ascription to Hugh of St. Victor,

though its priority has recently been called in question. Dom Lottin proposes to test the traditional view by comparison of texts relative to the problem of free will. His conclusion is that the *Summa Sententiarum* cannot be the work of the Victorine for chronological reasons, and that, as Chossat has maintained, it is probably later than the *Sentences* of Peter Lombard.] **C. H. Grandgent.** *Confessio Dantis.* [In English. The *Divina Commedia* is largely a personal confession of the poet. We can discover the faults to which he pleads guilty by noting with what offenders he shows sympathy. He admits, in this fashion, that he is tainted with pride of birth and genius, angry temper, quarrelsomeness, prodigality, carnal love; he owns to sympathy with the self-confidence which leads great thinkers into heresy and sorcery, and we gather from repeated hints that he condemns himself for proneness to jump to hasty conclusions. He indicates no sense of being seriously stained by gluttony, envy or sloth.] **R. Kremer.** *Bulletin d'épistémologie.* [Comments among other works on Collingwood's *Speculum Mentis* and Kemp Smith's *Prolegomena to an Idealistic Theory of Knowledge.*] **A. Fauville.** *Conceptions actuelles du développement psychique.* [Comments on E. L. Thorndike's *Educational Psychology* as showing the tenacity of associationist conceptions and on recent work, especially that of K. Koffka, in genetic psychology as illustrating the difficulties of associationism.] Reviews of books, etc.

KANT-STUDIEN. 1926, Sonderhefte 1-2. **Rudolf Lehmann.** *Das doppelte Ziel der Erziehung.* [A study of the relation between the practical and the cultural ends in education.] **Hans Vaihinger.** *Die Philosophie in der Schule.* **Konrad Eilers.** *Philosophie und Schule.* [Of these articles the first states very briefly a new scheme for teaching philosophy in ordinary schools, the second gives the arguments in its favour.] **Victor Henry.** *Bildungstypen.* [A brief statement of various new methods of education pursued at different schools.]

3-4. **Hans Rust.** *Der gegenwärtige Streit um die Mystik.* [List of definitions of mysticism by many leading authorities, followed by brief review.] **Bernhard Jansen.** *Die Bedeutung der Scholastik für die Metaphysik.* **Ernst Simon.** *Die weltanschauliche Lage des modernen Judentums.* **Salomo Birnbaum.** *Die ostjudische Weltanschauung.* Reviews, etc.

Heft 2-3. **Moritz Schlick.** *Erleben, Erkennen, Metaphysik.* [Tries to prove the impossibility of metaphysics as knowledge from the premiss that discursive knowledge is only of relations, never of content. The question, *e.g.*, whether two people have qualitatively the same experience when they say they see red, is unanswerable, if not meaningless, and the same criticism applies even to spatial and temporal relations. Therefore all the knowledge that can really be communicated, even in ordinary speech, is of purely formal relations, and the question, *e.g.*, whether the physical world exists unperceived or not, becomes meaningless. The article is cleverly written, but seems open to the objections that even formal relations presuppose for their understanding particular experiences of their nature. It would therefore be liable to the same criticism, and also his argument would, if valid, both destroy what nobody can really give up, *i.e.*, all knowledge of other people, and leave untouched the greater part of metaphysics, because the latter is rarely less formal than science in its conclusions about reality.] **Walter Del-Negro.** *Wahrheit und Wirklichkeit.* [Is specially concerned with causality as well as with general issue between Evidenztheorie and Konventionstheorie.] **Kurt Sternberg.** *Über die Unterscheidung von analytischen und synthetischen Urteilen.* [Criticism

and short historical account of Kantian distinction between analytic and synthetic judgments, followed by development of author's own theory that the distinction ought to be replaced by that between possibility, actuality and necessity as three stages through which one and the same judgment passes in becoming knowledge.] **Johannes Reimke.** *Leblos und lebendig.* [Defends view that life requires a super-material principle, with special reference to Kant.] **Fritz Heinemann.** *Die Geschichte der Philosophie als Geschichte des Menschen.* **Hans Hess.** *Das romantische Bild der Philosophiegeschichte.* [Both articles would better be headed 'philosophy of history' than 'history of philosophy'.] **Julius Kraft.** *Die wissenschaftliche Bedeutung der phänomenologischen Rechtsphilosophie.* [Criticises severely this treatment of the philosophy of the law with its rather *a priori* tendency. Author thinks that it invokes alternately a confusion between state laws and laws of reality, and again between the former and laws of morality.] **Arthur Liebert.** *Zur Logik der Gegenwart.* [Summary of notes by Maier in his edition of Sigwart's Logic. Emphasises specially the need for a logic of the "Geisteswissenschaften" distinct from the logic of physical science.] **Heinrich Levy.** *Paul Natorps praktische Philosophie.* **Paul Hoffmann.** *Riehls Kritizismus und die Probleme der Gegenwart.* **Rudolf Metz.** *Berkeleys Philosophisches Tagebuch.* [History of text and translations of latter since its first publication.] **M. Sztern.** *Zur Frage der Vereinbarkeit von Willensunfreiheit und Verantwortlichkeit.* [Discusses attempt by Ruesch to combine responsibility with the completest determinism. The author criticises his negative attitude to morality, but the main point of the article is the presentation of his rather unusual attempt to base a kind of retributive justice on hedonism. Ruesch's argument is that it is only fair that a man should suffer evil equal to the evil which he has inflicted on others, since the latter was, like everything else he does, according to hedonism, simply a means to what he considered his own greatest happiness. But would this prove the rightfulness of punishment or only of compensation?] Reviews, etc.

ANNALEN DER PHILOSOPHIE. 1926, Heft 6-7. **D. Kulenkampff.** *Entwicklung oder Entfaltung?* **Julius Schultz.** *Spannungen zwischen Methoden und Ergebnissen in der Philosophie.* [No metaphysics can be purely rational, for reason can only deduce the possible, not the actual. The starting-point and content are given otherwise than by rational means, hence the fundamental differences between the types of philosophy. Yet each type is under a necessity that forces it somehow to include its opposite which it at first ignored, so that there is a radical discrepancy between its starting-point and its conclusion. Thus the man whose interest is practical starts with an insistence on freedom to act and ends with a mechanistic conception that threatens all freedom, the adherent of objective truth ends in the subjective criterion of self-evidence, the relativist in regard to truth ends in the universal and objective standards of natural science. Most fundamental is the antithesis between a monism that regards the universe as the necessary emanation of a timeless being and a view that, admitting freedom, combines realism and vitalism. The man who assigns value to *activity* regards the original being (*cf.* the atoms of science) as pervious to reason and hence worthless, but activity as non-rational and hence free, the man who values *being* instead thinks of the origin of the world as above reason but its subsequent states as necessarily determined. For Dr. Schultz holds not only that the world is not fully rational, but that everything which can be comprehended by reason is therefore without value!] **Walter Dubislav.** *Über das Verhältnis der Logik zur Mathematik.* [Argues that mathematics is neither deducible from logic nor *vice versa*. Arithmetic cannot

be derived simply from the axioms which have been alleged to be deducible from logic but requires also as an independent axiom the principle that the number of integers is infinite, for there could be no logical contradiction between the assertion that there were only, *e.g.*, three numbers and the other axioms.] **Carl Fries.** *Gestalttheorie und Erkenntnislehre.* **Maria Groener.** *Fremddienliche Zweckmässigkeit.* [Argument against view expressed in earlier number that the apparent adaptation of organisms for the purposes of other organisms implies a super-individual soul.] **Hugo Dingler.** *Über die Grundlagen der Arithmetik und deren Widerspruchslosigkeit.* [An attempt to lay down and vindicate a formal basis of arithmetic].

Heft 8. **M. Pasch.** *Die axiomatische Methode in der neueren Mathematik.* [A systematisation of fundamental mathematical methods of proof by means of a special symbolism. Most of article applicable to proof in general and not only in mathematics.] **H. Gartelmann.** *Kritik der beiden Hauptbeweismomente des Kantschen Apriorismus.* [A criticism of Kant's two main arguments that space is *a priori*. The criticism of the proof from mathematics depends on a rejection, practically unsupported by argument, of the apriority of this science, but the criticism of the proof from the impossibility of thinking space away is much better. The author argues that we could represent space without bodies but not without light or shade.] Reviews, etc.

As supplement to the Annalen is issued the following book, *Die Allmasse*, by **Otto Franck**. This work starts from the position that the physical world is what is given by the senses and consequently arrives at the idea of six different kinds of mass corresponding to the five senses and the sense of warmth. The author is less concerned with a philosophical defence of the theory than with the attempt to work it out scientifically, and the book is consequently more for the physicist than for the philosopher.

VIII.—NOTES.

"*THIRTEEN EPISTLES OF PLATO.*"

To the Editor of "Mind".

Sir,

Your reviewer in his criticism of my interpretation of the Platonic Epistles (Mind, No. 139, p. 367) presents quite an array of errors. Many of them are, however, his mistakes and not mine, as I hope to show.

With regard to the genuineness of the letters I admit that there is no clear case against V. Plato may have written it on an off day. With regard to IX and XII the case is different. The pedestrian style of these does not resemble anything in Plato and it does resemble that of dozens of forgeries which are to be found in Hercher's *Epistolographi Graeci*. The date when these letters entered the accepted canon of Plato, even if it could be known to be as early as the fourth century, would not prove their genuineness. Neither is it likely that Plato or anyone else ever wrote a letter without an introductory greeting. In XIII the greeting serves as the subject of the first sentence, though the fact is not so indicated in Burnet's edition. The greeting of III is treated by Burnet as part of the letter. In VIII the superscription is evidently original, since it is referred to in the first words of the letter. Either the form of the name in the greeting of IX has been corrupted, which is not likely, or the letter is spurious.

I acknowledge with chagrin my howler at IV, 320d. Prof. Taylor may be right in thinking that τῇδε in 320e 1 refers to those at Athens, but it is not so of course, probably not so at all. In 321b 5 τῶν τῇδε certainly refers to affairs in Sicily, as τῇδε does in VIII, 352d. Expressions of place in letters, like expressions of time, must sometimes be interpreted in an epistolary sense. In 344a and 346e Prof. Taylor is right and I am wrong. VII, 348a.—You can hardly start game without frightening it away. To describe the same action in III, 318b 7 Plato uses the word ἐκφοβεῖν, 'to frighten one from something'. Plato is the persistent dog who keeps coming back for his bone and has to be shooed off. Plato was to be frightened off the subject of course, not off the island. VII, 349c.—Here again it is in point to compare Plato's statement in III, 318, which makes it clear that the charge of conspiracy brought against Plato forced him to break off relations with Dionysius and did serve as Dionysius' pretext for withholding Dion's funds. The plot is also referred to in VII, 329c and 350c. The latter passage shows that the charge was serious enough and that Plato feared for his life. Prof. Taylor has to stretch the meaning of ἐπιβουλή to get his version, and it is not likely that Dionysius would make his own plot, rather than Plato's, the pretext for a quarrel. VI, 322e 1.—Prof. Taylor has apparently not noticed where his translation of δύναμιν will land him when he gets to δύναμιν in line 6. VI, 323d.—If Plato wanted his friends to swear by the father of the ἡγεμών, he should have put an article before πατέρα.

With regard to the Platonic Socrates I am not yet ready to accept Prof. Taylor's authority in preference to that of Plato, who says plainly enough (VII, 326a-d) that two doctrines, which are expounded by the Socrates of the *Republic*, are Plato's own, both arrived at some time after the death of Socrates, and one, that about the detrimental effect of luxury on character, practically ten years after Socrates was in his grave. With regard to the second epistle it has been pointed out frequently enough that the friendly tone of the letter is quite incompatible with the enmity and suspension of all communication between them, which Plato says (III, 318e) was the result of their quarrel in the year 361. The third epistle is not a friendly letter but a polemical pamphlet. Prof. Taylor's surmise that Plato and Dion may have been together at the Olympic games of 360 B.C. is correct; Plato says so in VII, 350b. I agree that Plato and Isocrates were probably friends more or less; they were also rivals; and I do not think so hardly of either of them as to suppose that he was in the habit of beating the air in his published works.

One more point. Prof. Taylor, in reproving me for a howler of which I am guilty in company with every other translator of the Epistles whose work is published, implies that my mistake is a blot on the scutcheon of Harvard University. Since that excellent institution has never yet deigned to offer me even an instructorship, it deserves to be publicly exonerated. If Prof. Taylor had discovered by glancing at the title-page of my book that I ply my trade at Haverford College, far away in Pennsylvania, it may be that my errors would have seemed to him less astounding. In any case I am grateful to him for pointing them out.

L. A. POST.

Haverford College,
Haverford, Pa., U.S.A.

TO THE EDITOR OF "MIND".

Mr. Post has certainly convicted me of one error, the misreading of *Haverford* as *Harvard*, for which I can offer no excuse which satisfies my conscience. For the rest, he handsomely admits that I am right on a fair number of the points he enumerates. As to the remainder, I cannot see that he anywhere *proves* me to be mistaken, though it would be impossible here to argue all the cases in detail. I may say that he has misunderstood the meaning of my remark about the superscriptions of *Epistles* IX and XII. I never meant to imply that XII could have been originally without an "address". My point was that such superscriptions are more easily modified by transcribers than any other part of an epistle, since they come to be treated as "headings". I still hold that Mr. Post's argument from the occurrence of the form *Archytas* in such a superscription is not, of itself, enough to prove spurious a letter known and admired as Platonic by Cicero. Mr. Post's best point, to my mind, is his defence of his rendering at VII. 349c. 5 ff., but it leaves me still unconvinced. Linguistically I am sure Mr. Post is mistaken in assuming that ἐπιβουλή there means "plot". Like Ast (Lexicon, *s.v.*), I take the meaning to be *consilium*, *Vorsatz*; "Dionysius thought his old scheme of withholding Dion's property a plausible ground for a breach with me". This is the only rendering which, so far as I can see, the context allows, and, to my mind, also the only rendering permitted by syntax. Nor does it "stretch" the meaning of ἐπιβουλή. As to the ἀμυντικὴ δύναμις of *Ep.* VI, I have no difficulty. The words literally mean "a power to protect them," a periphrasis, as I said, for "a protector". This "power," Plato goes on to say, would be found in Hermeias. How that remark

can be consistent with Mr. Post's rendering of *ἀμυντικὴ δύναμις* by "a faculty of *self*-protection" I do not understand; it is strictly consistent with my version. Mr. Post will probably not be convinced on these points, and I know, of course, that demonstration is out of the question. On VI. 323*d* 3-4 I should not like to dogmatise, but I imagine Mr. Post himself would admit the reality of the difficulty I raised. He does not dispute my statement about the traditional Neo-Platonic interpretation, and would presumably allow that the Neo-Platonists who maintained it are at least as likely to have understood Greek idiom about the article as he or I.

Some of the matters in which I found it hardest to follow Mr. Post's view are, I observe, not mentioned in his communication. I should be far better pleased if I could convince him that his discovery of spiteful references to Dion in Isocrates was mistaken than I could be by his acceptance of my contentions on any verbal points.

A. E. TAYLOR.

"*CONTEMPORARY BRITISH PHILOSOPHY (SECOND SERIES).*"

TO THE EDITOR OF "MIND".

SIR,

In his notice of *Contemporary British Philosophy* (Second Series) in MIND, N.S., 140, Mr. G. C. Field seems to suggest that I am "not fair" to Green and Bradley and that I "wrest" the words of Aristotle from their meaning. May I say that if I have been in the least "unfair" to two philosophers for both of whom I have a profound reverence and with one of whom I enjoyed an unusually close friendship for thirty years, the unfairness is, at least, unconscious. I may have misinterpreted Green, but I have avowed my difficulty in ascertaining his precise meaning and even made a point of quoting the passage which seems to make most against my own tentative interpretation (*op. cit.*, p. 286, n. 1). I am confident that Bradley would have acquitted me of even unconscious "unfairness".

On the second and more important point, the meaning of Aristotle's *διάνοια αὐτὴ οὐθὲν κινεῖ, ἀλλ' ἡ ἕνεκά του καὶ πρακτίκη*, I submit that, as a mere matter of scholarship, only one rendering is possible. "It is not thought *in genere* which moves us, but thought with a purpose, *i.e.*, practical thought," and that my statement that Aristotle does not mean to say that thought *ἕνεκά του* requires to be supplemented by anything non-rational before it "moves" us is the correct interpretation. Aristotle means that, as he has explained earlier, what moves us is *βούλησις*, *will* for an end, and *βούλησις* is not simply identical with *ὄρεξις*, it is the distinctive form *ὄρεξις* takes in an intelligent being. So far as I know, this was the recognised interpretation until certain modern Oxford tutors devised a rival "determinist" exegesis. Thus St. Thomas expounds as follows, "dicit ergo primo, quod quamvis mens sit principium actus, tamen mens ipsa, secundum se absolute considerata, id est ratio speculativa, nihil movet, quia nihil dicit de prosequendo vel fugiendo, ut dicitur in tertio de Anima, et sic non est principium alicuius actus, sed solum illa quae est gratia huius, id est, quae ordinatur ad aliquod particulare operabile sicut ad finem, et haec est ratio vel mens practica". *Cf.* the curious note of Grant *in loc.* who, having to admit that this is the plain sense of the words and at the same time supposing—unlike St. Thomas who really understood the *de Anima*—that the *de Anima* teaches something else, makes *Eudemus* guilty of "mixing up" things in the E.N.

A. E. TAYLOR.

To the Editor of "Mind".

Sir,

I should greatly regret it if Prof. Taylor had for a moment the impression that I was accusing him of deliberate misrepresentation. Nothing could be further from my thoughts. It is obviously impossible in dealing with a book of this nature to discuss fully all the many different points that arise. I tried therefore simply to indicate the chief points on which doubts and difficulties might be felt and further discussion might, therefore, seem called for. But when I expressed such a point in the form of a question, I did not mean to imply that I knew that I had the answer, and if I suggest that I am not sure whether Prof. Taylor is fair to Green or Bradley this does not mean that I am sure that he is not fair.

Even on the point of Aristotelian interpretation the question form expressed my real mind, because I am even yet not quite certain how much Prof. Taylor means to claim. Obviously I cannot discuss the question fully here. But I may just put the point that I am chiefly concerned to maintain. That is that Aristotle holds that thought, or any cognitive process, cannot move us to action in the absence of an element of feeling in the form of desire. In that sense, thought does require to be supplemented by something non-rational. If Prof. Taylor denies this, as I am inclined to think he means to do, then I think that he is wresting the words of Aristotle from their meaning, and I shall be happy to argue out the question with him on some more appropriate occasion.

G. C. Field.

"*Grundgesetze des Sollens.*"

Mr. Laird has in No. 139 of Mind reviewed my little book on *Grundgesetze des Sollens*. I do not intend to reply to his criticism, but the manner of his representation of my views compels me to state the following—

Mr. Laird recites my *Axiome des Sollens* and then reports that I infer from them: "All actual states of affairs are unconditionally what they ought to be; a state of affairs that actually exists ought to exist". But Mr. Laird omits to quote, what has been emphatically expressed in my book, that by these axioms only a *modified* notion of the "Sollen" is established, to begin with; that what "ought to be" in this meaning, ought to be in the sense of a "materially correct" (quasi-divine) volition which is realised without any exception. The chief purpose, however, of my investigation was—and this is quite clearly stated in the course of it—to show how, considering these ideal laws of the "materially correct" volition, the "*eigentliches* Sollen" (*i.e.* The *proper* ought-to-be), which alone is authoritative for our ethical volition, would have to be defined. Of this volition, however, my paper does not postulate the perfect *material* correctness, which is unattainable for us, but the *formal* or *inner* correctness, which represents the nearest possible approach to the former. I have determined the essence of the latter volition and, by doing so, also the necessary and sufficient conditions of ethic "Sollen" and of Value. I have attempted in my book, by means of intensified methods, to give a new solution for the fundamental problem of the all-in-all of ethics, the problem which Kant tried to solve by his "categorical imperative".

If Mr. Laird finds the result of my investigations to be "modest," this view is his business only; but he ought not to have given instead of my result something that does not at all answer to this name.

E. Mally.

SIXTH INTERNATIONAL CONGRESS OF PHILOSOPHY, 1926.

THE Sixth International Congress of Philosophy, which was held at the University of Harvard, September 13 to 17, was in many respects a noteworthy gathering. For one thing, it was the first of these congresses which has been held in America. And, for those especially of the delegates who had not before set foot on the soil of the New World, it provided a memorable experience. No better preparation for the serious business of the Congress could have been devised than a week of perfect summer weather on the broad Atlantic, the enjoyment of which was enhanced, for those of us who crossed in the *Caronia*, by the good fortune of having Prof. A. E. Lovejoy, of Johns Hopkins University, as a fellow-passenger. On landing at New York, we met with uniform hospitality and kindness; and no sooner did we reach the Bureau of the Congress in Smith Hall, Harvard, than we became conscious of the extraordinary care that had been taken in the arrangements for entertaining the foreign guests. Prof. R. B. Perry was unremitting in his efforts to secure the smooth working of the organisation, and he was efficiently assisted by Professors J. J. Coss, J. H. Woods and A. C. Armstrong. Dr. R. Demos and a number of other Harvard men spared themselves no pains to render every possible service they could to the visitors. Both from the meetings themselves and from the many pleasant opportunities of less formal intercourse, the fact speedily evinced itself that the philosophical problems which are uppermost at the present time in England are living problems in America likewise. Then, again, this was the first international congress of philosophy that has taken place since the war; and the spirit of mutual cordiality that prevailed amongst the representatives of different countries filled one with hopes for the future. Altogether, some four hundred active members and three hundred associate members were present. Ninety-one of the former had come from other countries, and of these seventeen were from Great Britain, thirteen from Germany, and seven from France.

The Congress was opened on Monday evening, 13th September, by a meeting in the Gore Hall, over which President Murray Butler, as Chairman of the organising Committee, presided. He took the opportunity of alluding in felicitous terms to the proceedings at Locarno, and the admission of Germany into the League of Nations, emphasising, at the same time, the greatness of Germany's contribution to philosophical thought. President A. L. Lowell spoke on behalf of Harvard University, and dwelt upon the necessity of philosophical criticism as a means of co-ordinating and bringing to light the deeper significance of the results of specialised scientific research. The Presidents of the three divisions of the American Philosophical Association followed, of whom Prof. W. E. Hocking, representing the Eastern Division, spoke of the influence of individual, national and international factors in determining the direction of philosophic reflection. The Rector of the University of Paris, Prof. Paul Lapie, in responding on behalf of the foreign delegates, warmly concurred with the sentiments that had been expressed, but drew attention to the difficulties that stood in the way of intellectual co-operation among the nations, difficulties, however, which it ought not to be beyond the power of philosophers to find a means of surmounting. After this meeting, an informal gathering was held in the Common Room of Gore Hall where, in addition to greeting old friends, we had the pleasure of making the acquaintance of many new ones.

The business of the Congress was distributed amongst four departments. Division A included Metaphysics, the Philosophy of Nature and Mind, and the Philosophy of Religion; Division B, Logic, Epistemology and the

Philosophy of Science; Division C, Ethics, the Theory of Value, Social Philosophy and Æsthetics; Division D, the History of Philosophy. On the mornings of the four days each of the Divisions was in session; in the afternoons and evenings there were conjoint meetings of all the Divisions at which matters of more general interest were discussed. I will say something, first, about the work of the several Divisions, and then refer briefly to what happened at the conjoint meetings.

I.

A. The first theme of discussion was "Physics and Metaphysics, with special reference to the problem of Time". Prof. E. B. McGilvary sought to show that the relativity of time is dialectical, and not existential, in character. Prof. Hermann Weyl contributed an important paper on "Time-relationships in the Cosmos". He distinguished between Proper-Time (*Eigenzeit*), Immanent Time and Metaphysical Time. The abstract time-relations of the four-dimensional continuum of the external world are based upon concrete causal connexions; and, instead of describing the causal connexion from past to future as passing through a present like a plane in which past and present adjoin without interstitial space, modern physics replaces the plane by a light-cone issuing from what may be called the "world-point" contained in the present. In consequence of the world's metrical structure, pieces of the world-time may be compared with one another as regards their length. This proper-time is the physical basis of the immediate estimation of immanent time, which, as contrasted with the objective and relative, is subjective and absolute. Immanent time is a continual *Now* filling itself with changing contents. The conception of the living point-moment tracing its world-line in temporal succession introduces us to metaphysical time as that wherein objective and subjective time are connected, although as to what exactly was to be understood by the phrase 'metaphysical time' Prof. Weyl left his hearers in doubt. Prof. A. N. Whitehead expounded his doctrine of time as a stratification of nature, as 'epochal,' to use his new term. The ultimate facts of nature he takes to be 'occasions'; and each 'occasion' to be an organism by virtue of its prehension of all other 'occasions' into itself. If occasion A precedes occasion B, there is incompleteness in A by the indetermination of B as objectified for A, and completeness in B by the determination of A as objectified for B. A has physical anticipation, B has physical memory. Physical memory is causation, and conscious memory is partial mental analysis of physical memory. Through 'supersession,' occasions develop a continuity between one another; there is a becoming of continuity, but there is not a continuity of becoming. Prof. C. H. Mead read a paper at the same meeting in which he tried to establish the objective reality of perspectives; and a contribution by Prof. A. V. Vasilieff, of Moscow (who was unable to be present), in which an attempt was made to work out the position of Mach, in the light of recent mathematical analysis of the space-time continuum, was also considered.

On the Thursday morning, the topic was "The Philosophy of Mind, with special reference to the nature of community between minds". Prof. P. E. Wheelwright spoke of self-transcendence as essential to personality. Dealing more particularly with the question of the nature of Mind, Prof. J. A. Smith, of Oxford, urged that the best description of 'Mind' is to be found not in the works of philosophers or psychologists, but in the masterpieces of poets, novelists and dramatists. Mind first manifests itself, he argued, as that which finds and contemplates beauty, the presence of which in objects is the first sign of the existence of mind

in the universe. Mind is what *expresses* to itself that which is then present to it, and the evidence of its success in expression is the contemplated beauty of what is expressed. Expression essentially involves publication and communication, and, therefore, several minds and a world common to them, which acts as a medium of communication between them. Reflection upon this description yields the definition of the nature of a Mind as self-consciousness, and of the world of minds as expressing themselves to one another through an unconscious medium. It is in the masterpieces of art and literature that there is best shown what this unconscious medium is, and in them lie the best clues to its nature, as also to the nature of what produces or carries it on in the universe. Prof. W. H. Sheldon, while disputing the existence of 'matter,' insisted that reality comprises immaterial objects as well as minds. Prof. H. A. Overstreet could discern a real community of minds as only dimly present in finite social communities, but conceived of such community as more fully achieved in a transfinite realm by the superlogical processes of art, devotion and love. The final paper was that of Dr. Will Durant on "Behaviorism and Philosophy," who made rather a journalistic use of J. B. Watson's prediction that "within fifty years philosophy will have disappeared".

On Wednesday morning, under the chairmanship of Prof. Felix Adler, and later of Prof. J. B. Pratt, the subject discussed in this Division was "Mysticism in Religion". The papers were by Prof. D. Starbuck, Dr. S. N. Dasgupta, Prof. H. von Glasenapp, of Berlin, Prof. C. A. Bennett and Prof. E. S. Ames. Prof. Starbuck described a series of experiments conducted under his direction on 750 college students. The mystics proved to be decidedly at a disadvantage in information, comprehension and general intelligence. They tended slightly towards pessimism and social responsiveness, and were more suggestible. Prof. Bennett urged that the mystic does not seek to abolish thought, but that he suspends the operation of discursive thinking in favour of an intuitive knowledge of reality. At the moment of experience the content of the intuition is, like all new insights, conceptually indefinable, but the discontinuity is not complete, otherwise the insight would be indistinguishable from absurdity or contradiction. Prof. Ames insisted upon the necessity of drawing a distinction between the *experience* of the mystics and their *doctrine*.

At the last meeting on Friday morning, papers were read by Prof. E. S. Brightman on "Personalism and the Influence of Bowne," by Prof. R. Müller-Freienfels of Berlin on "Das Problem der Individualität," who gave some telling illustrations from various departments of modern thought to show that individuality, notwithstanding its paradoxes, is a category which neither life nor science can dispense with, by Prof. E. A. Burtt on "Real *versus* abstract Evolution," and by Dr. E. W. Lyman on "Religion and Ethics".

B. The meetings of Division B began on the Tuesday morning with a discussion on "Sensa and Scientific Objects". Dr. Edgar Wind, in a paper on "Experience and Metaphysics" dealt with what he called a paradox inherent in physical inquiry: the formulation of physical laws is based on measurements carried out within the field of physics, while measurements carried out with physical instruments are themselves subject to physical laws. This paper was followed by one on "Sensible Appearances and Material Things" by the present writer. It was an attempt to show that given a perceptual situation in which a cognitive act is directed upon a physical object possessing primary and secondary qualities, the contrast between 'appearance' and 'reality' must of necessity arise. So far from its being "always difficult to understand how anything can seem to have characteristics which are other than those which it really does have," the difficulty would rather be to understand

how, under certain circumstances, a thing could fail to seem to have such characteristics. The doctrine of sensa as independent existents was criticised, and it was argued that the modern scientific theory of matter is perfectly compatible with the view of a physical object being characterised by the qualities called secondary. Prof. Bruno Bauch of Jena read a paper on "The Status and Relations of Sensa and Scientific Objects," in which he maintained that science starts from the sphere of sense, then departs from it in order to return to it again. The chasm between sensa and scientific objects is bridged over, so he conceived, by concepts, regarded not as formal abstractions but as functional articulations of experience. Prof. H. C. Brown criticised the notion of sensa from the point of view of genetic psychology. In the debate that ensued, Prof. Lovejoy came to the rescue of the sensum theory, although I gathered he conceived of sensa as mental entities.

Wednesday morning's sitting was devoted to a consideration of "The Doctrine of Subsistence and Essences in current Logic and Epistemology". Prof. R. W. Sellars outlined the view of the American school of 'critical realists'. An act of cognition is, he maintained, a specialised act of the organism in which objects are selected and interpreted in terms of characters functioning *within* the individual's consciousness. These characters are not entities but discriminations intrinsic to the presented field open to awareness. Such logical elements have no separate existential status. Prof. R. F. A. Hoernlé contended that if Reality be a 'whole,' the difference between existence and subsistence can be only relative, one of aspects. The minimum fact of immediate experience is, he insisted, a 'this-such,' which on analysis turns out to be a universal, or complex of universals, realised or embodied in a particular. In the debate, Prof. Hoernlé was challenged to explain what he meant by 'realised,' but he admitted the difficulty of doing so. A very interesting paper was read by Prof. Moritz Geiger of Göttingen on "The Phenomenological Method". This method, which starts by asking what is given and how it is given, leads, he said, inevitably to the acceptance of subsistence. The analysis of logical facts shows that every meaning has an object which is either existent or subsistent, that no proposition can be stated without indicating essences in the facts. Prof. A. W. Moore argued that "critical realism" shares with neo-realism all the difficulties arising from the metaphysical separation of meanings and essences from existence.

The third sitting on Thursday morning was given up to a consideration of the bearing of the distinction of judgments of value and judgments of existence upon logic and epistemology. Prof. W. M. Urban was of opinion that while thought may establish the inseparability of value and existence, that is as far as thought can reach. Any fusion of value with existence can be accomplished only by an act of mysticism, an act, however, which is continually being performed in life. Dr. F. C. S. Schiller upheld the view of the ubiquitous interpenetration of 'fact' and 'value'; these should not be regarded as antithetical, but as categories which any inquirer is free to use, as suits his purpose. Prof. L. T. Russell urged that the demands which we make upon reality cannot in the long run be sustained unless they receive certification by facts; but, until the facts certify all the then outstanding demands, practical, ethical, religious, etc., certification will not be complete and our account cannot be accepted as final. Lastly, Prof. A. P. Brogan, of Texas, argued that, if distinguishing between better and worse is the fundamental character of value-judgments, these judgments have to do not with relations between universals *per se* or between particulars *per se* but with relations between what may be termed factual complexes, real or imagined.

C. In the discussion of Tuesday morning on "The Basis of objective

judgments in Ethics," there seemed to be unanimity in rejecting subjectivism in moral theory. Prof. L. Lévy-Bruhl, of the Sorbonne, defended the procedure of descriptive sociology in accepting objective ethical judgments by reminding philosophers that even the unlearned have a 'nice moral sense'. Prof. W. D. Ross, of Oxford, argued powerfully against the doctrines that good is determined by the feeling of approval, or by the satisfaction of desire, or by inference from universal premisses, and insisted that awareness of good is based upon direct experience. Papers were also read by Miss M. W. Calkins and by Prof. G. P. Adams, the latter of whom rested his case for objectivity in moral judgments on the 'bi-polar' character of all experience, the reference, namely, of cognitive acts to objects.

On the Friday morning, a number of miscellaneous communications were considered, but the outstanding feature was a paper by Miss H. D. Oakeley on "The Perspective Theory of Knowledge in relation to History and Ethics". The thesis propounded was that while it is essential to recognise an absolute character in the individual's experience of value, yet the particular form and content of that experience must be unique for each and relative to each. Personality is the bearer of value, and the ground of its absolute character is that it is essential to the being of the personal principle. It is because the value-experience ultimately means the creative life of personality that history is significant. History is the interpretation of the data of existence by personal beings in such a way as to cause the value-experience to emerge. 'Value,' on this interpretation, is not identical with 'good,' but of wider significance. Fundamental to it is such an arrangement of the elements of experience as makes possible the life and activity of persons, and allows the struggle of the personal principle for more universal being to advance. Two other interesting communications to this meeting were those of Prof. Paul Lapie on "Moral Education in the French Schools" and of Prof. G. Tauro on "Schools and Education in the new Italy".

The remaining two sittings of this Division were mainly occupied with questions of Æsthetics. On the Wednesday morning Dr. Nicolai Hartmann, of Cologne, spoke "Ueber die Stellung der ästhetischen Werte im System der Werte überhaupt". He tried to describe æsthetic values as appearances of an ideal world in the actual world in such a way as to account for the peculiar coincidence of impotence and freedom in æsthetic values. On the Thursday morning, Prof. Moritz Geiger read a paper, "Ueber Oberflächenwirkung und Tiefenwirkung der Kunst".

D. In the History of Philosophy Section, the topic on Tuesday morning was "The Socratic and Platonic elements in the doctrines of Plato's Dialogues". The discussion turned chiefly upon the interpretation of the *Phaedo*. Owing to illness, Prof. J. Burnet was unfortunately prevented from attending and his paper was read by Prof. Ross. Prof. Léon Robin, of the Sorbonne, considered it highly improbable that the *Phaedo* is a historical report of the last words of Socrates. If the Socrates of the *Phaedo* is historical, then, he argued, the Platonic philosophy would contain little that is original.

On Wednesday morning the Division met to discuss "Mediæval Philosophy, with special reference to the problem of Creation". Prof. Étienne Gilson, of the Sorbonne, in an interesting communication on "Arab Philosophies in relation to Scholasticism," pleaded that the influence of Arabian philosophy was by no means confined to Aquinas's debt to Averroes. Prof. H. A. Wolfson dealt with "The Problem of Creation in mediæval Jewish Philosophy," and compared the doctrine of emanation in that philosophy with current notions of 'emergence'.

Two other sittings of this Division were devoted to receiving reports on

present philosophical tendencies in different countries. There was also an important communication from Dr. B. Rand concerning the forthcoming appearance of two hundred hitherto unpublished letters between Locke and Samuel Clarke, covering uninterruptedly the period from 1682 to Locke's death.

II.

The General Session on Tuesday evening was occupied with the hypothesis of emergent evolution. In a carefully thought out paper, which ought to have come first instead of third on the list, Prof. A. E. Lovejoy sought to determine precisely the meaning of the term 'emergence' and to furnish reasons for regarding as probable the hypothesis of the emergence of psychical events and psychical objects as functions of special and late-evolved integrations of matter and energy. But he resisted the view that this theory carried with it any necessity for a teleological interpretation. Prof. Hans Driesch, of Leipzig, criticised Lloyd Morgan's treatment of the problem, and contended that no good case could be made out for emergence in the inorganic world. With regard to the organic world, if no determinate entelechy is assigned to account for emergence, then emergent evolution would amount, he insisted, to the undetermined evolution of Bergson, this sort of evolution being unpredictable not only for man but in principle. Prof. H. Wildon Carr, on the other hand, took the theory of emergent evolution to be antithetical to that of creative evolution. He maintained that life and mind are not emergent qualities, that their appearance does not inaugurate any new stage or level of cosmic evolution, but that they are the outward expression of an active force, purposive in its mode and free in its range. Prof. W. M. Wheeler, speaking as a biologist, emphasised the necessity of attending to the minor gradations and emergences within or between the great levels in nature. A study of them would, he argued, reveal more clearly the behaviour of the parts that ultimately results in the emergence of novelty.

At the afternoon General Session on Friday the theme of discussion was "Continuity and Discontinuity among the Sciences". Prof. F. Enriquez, of Rome, took the view that there is a fundamental unity of the sciences, both in relation to the reality which is assumed as their object, and in relation to the mind, that is to say, their subjective aspect. On the other hand, Prof. Erich Becher, of Munich, discerned a radical discontinuity or difference in subject-matter, methods and basal principles between the *Realwissenschaften* (natural and mental sciences) and the *Idealwissenschaften* (mathematics and logic). The latter have to investigate *daseinsfreie Gegenstände* or *Soseinsobjecte*. Prof. W. E. Hocking's paper on "Mind and Near-Mind," also read at this meeting, is difficult to summarise. Seeing that the subject of knowledge can never become an object, the effort to make mind the subject-matter of a science can, he argued, never wholly succeed. Yet the effort cannot be given up, and the consequence has been the production of various substitutes for mind—logical objects, essences, possibilities, and the like—which can be regarded for certain purposes as equivalents for mind. These he called 'near-minds' or 'mural images of mind'.

For Wednesday afternoon the subject prescribed was "The rôle of Philosophy in the History of Civilisation". There were papers by Mr. H. Osborn Taylor, Prof. Gilson, Prof. Radhakrishnan, and by Benedetto Croce (read in his absence by Dr. R. Piccoli), but the outstanding feature was Prof. John Dewey's contribution. The capacity to express itself in philosophies is, said Prof. Dewey, one of the severe tests of the force and

genuineness of any civilisation. It is, he thought, proof of at least the immaturity of American life that it has accomplished so little in original philosophical thought. Until this deficiency is remedied, American arts and sciences, in spite of enormous display of energy, will remain relatively superficial. The greatest need of the national culture is an awakening of courageous faith in the value of speculative imagination, provided it be supplied with an adequate body of experience.

I can do no more than mention the meeting on Thursday evening, the subject of which was "Philosophy and International Relations," and which was noteworthy on account of Prof. Roscoe Pound's brilliant paper on "The Part of Philosophy in International Law".

The Congress was brought to a close on the Friday evening by a banquet in the Copley Plaza Hotel, under the auspices of the Commonwealth of Massachusetts, at which Mr. Wellington Wells, President of the Senate, presided on behalf of the Governor. Prof. Driesch, Prof. J. A. Smith and others spoke for the foreign delegates, and Prof. W. P. Montague effectively replied on behalf of the organising Committee.

G. Dawes Hicks.

SOCIETAS SPINOZANA.

On 21st February, 1927, two hundred and fifty years will have passed since Spinoza's death, and it is proposed to hold then a memorial gathering at the Hague which will be addressed by foremost thinkers from different parts of the world. The presence of all interested is invited.

A special committee has been formed for the purchase of the house in the Paviliоensgracht in which Spinoza lived his last years. It is hoped to hold the memorial assembly in the house and to inaugurate it formally as the Spinoza House.

Further particulars will be published in due course in the public press.

November, 1926.

ERRATA.

In the last number of Mind, October, 1926,

p. 504, l. 19, for "the particular" *read* "two particular";
p. 506, l. 12, for "Nature" *read* "nature";
p. 534, l. 7 from bottom, for "White 9" *read* "White 19".

MIND ASSOCIATION.

The following is the full list of the officers and members of the Association :—

OFFICERS.

President—MISS B. EDGELL.

Vice-Presidents—PROFS. S. ALEXANDER, J. B. BAILLIE, H. WILDON CARR, W. J. DE BURGH, G. DAWES HICKS, F. B. JEVONS, A. D. LINDSAY, J. H. MUIRHEAD, A. S. PRINGLE-PATTISON, C. READ, A. ROBINSON, J. A. SMITH, N. KEMP SMITH, W. R. SORLEY, G. F. STOUT, and PRINCIPAL G. GALLOWAY.

Editor—PROF. G. E. MOORE.

Treasurer—DR. F. C. S. SCHILLER.

Secretary—MR. G. R. G. MURE.

Guarantors—EARL OF BALFOUR, VISCOUNT HALDANE, and MRS. HENRY SIDGWICK.

MEMBERS.

ADE (F. C.), Jordans, Crescent Road, Bishop's Stortford, Herts.
AINSLIE (D.), The Athenæum, Pall Mall, S.W. 1.
ANAND (R.), ACHARYA (Swami Sri), Gaurisankar-Saeter, Alvdal, Norway.
ALEXANDER (Prof. S.), The University, Manchester.
ANDERSON (J.), Department of Philosophy, The University, Edinburgh.
ANDERSON (Prof. W.), University College, Auckland, N.Z.
ATTLEE (C. M.), Dept. of Education, 22 Abercromby Sq., Liverpool.

BAIN (Mrs.), 50 Osborne Place, Aberdeen. *Hon. Member.*
BALFOUR (Rt. Hon. Earl of), Whittingehame, Prestonkirk, N.B.
BARKER (H.), Cairnmuir Road, Corstorphine, Edinburgh.
BARRETT (Prof. C. L.), University of California, Southern Branch, Los Angelos, Cal., U.S.A.
BARTLETT (F. C.), St. John's College, Cambridge.
BATES (J. A. E.), Directorate-General of Posts, Shanghai, China.
BEAUMONT (B. F.), Park House, South Road, West Hartlepool.
BEECH (F. P.), 26 Ferrers Road, Oswestry.
BEGG (J. C.), 12 Fyfield St., Roslyn, Dunedin, N.Z.
BENNETT (E. S.), 75 Rodney Court, Maida Vale, W. 9.
BERKELEY (Capt. H.)., Les Anthemis, Beaulieu, Alpes Maritimes, France.
BLEVIN (W. P.), 21 Belmont Drive, Newsham Park, Liverpool.
BLUNT (H. W.), 183 Woodstock Road, Oxford.
BONAR (J.), 13 Redington Road, Hampstead, N.W.
BOWMAN (Prof. A. A.), The College, The University, Glasgow.
BRAHAM (Rev. E. G.), 41 Arkwright St., Bolton.
BRAITHWAITE (R. B.), King's College, Cambridge.
BREN (Rev. R.), 68 Wheeleys Road, Edgbaston, Birmingham.
BRETT (Prof. G. S.), The University, Toronto, Canada.
BROAD (Dr. C. D.), Trinity College, Cambridge.
BROSNAN (Rev. J. B.), St. Patrick's Church, Rochdale.
BROWN (G.), The University, Glasgow.
BROWN (Dr. J. J.), 56 Wolborough St., Newton Abbot, Devon.
BROWN (Dr. W.), Ch. Ch., Oxford.
BULL (H.), Copse Side, Boar's Hill, Oxford.
BURGH (Prof. W. J. de), 2 Southern Hill, Reading.

CAMERON (Rev. Dr. J. R.), 6 Albyn Terrace, Aberdeen.
CAMPION (G. G.), Inglegarth, Bramhall, Cheshire.
CARPENTER (Rev. Dr. J. E.), 11 Marston Ferry Road, Oxford.
CARR (Prof. H. W.), 8 Earls' Terrace, Kensington, W. 8.
CHADWICK (J. A.), Trinity College, Cambridge.
CHAMPNESS (E. F.), Leatherdale, Park Hill Road. Wallington, Surrey.
CLARKE (J. P.), 39 Cromwell Road, London, S.W. 7.
COIT (Dr. S.), 30 Hyde Park Gate, London, S.W.
CONNELL (Rev. J. D.), 7 Coates Place, Edinburgh.
COOKE (H. P.), Clevelands, Lyndewode Road, Cambridge.
COOKE (Dr. R. B.), 2 Hilton Hall, Portland, Me., U.S.A.

DAMLE (Prof. N. G.), Fergusson College, Poona, India.
D'ARCY (Rev. M. C.), St. Beuno's College, St. Asaph, Wales.
DAVIDSON (Prof. W. L.), 8 Queen's Gardens, Aberdeen.
DAVIES (Prof. A. E.), Colorado College, Colorado Springs, U.S.A.
DENNES (Prof. W. R.), University of California, Berkeley, Cal., U.S.A.
DESSOULAVY (Rev. Dr. C.), 171 Fentiman Road, S.W. 8.
DEWAR (Rev. L.), St. Anselm's Hall, Manchester.
DIXON (Capt. E. T.), Racketts, Hythe, Hants.
DODD (P. W.), Jesus College, Oxford.
DORWARD (A. J.), Trinity Field, Adams Road, Cambridge.
DUCASSE (Prof. C. J.), Brown University, Providence, R.I., U.S.A.

EALES (W. C.), The University, Cape Town, South Africa.
EDGELL (Miss B.), 15 Lyon Road, Harrow.
EDWARD (Rev. Dr. K.), Mansefield, Peebles.
EDWARDS (Rev. E. W.), Bicknor Rectory, Hollingbourne.
ENGLAND (Rev. F. E.), 3 Queen's Road, Leytonstone, E. 11.
EWING (Dr. A. C.), University College, Oxford.

FAWCETT (E. D.), Le Verger, Clarens, Switzerland.
FERGUSON (Prof. A. S.), Armstrong College, Newcastle-on-Tyne.
FIELD (Prof. G. C.), The University, Bristol.
FITZGERALD (A.), 19 Prince's Gate, S.W.
FLOWER (Rev. J. C.), 84 Chesterton Road, Cambridge.
FORSYTH (Prof. T. M.), Grey College, Bloemfontein, South Africa.

GALLAGHER (Rev. J.), Crowton Vicarage, Northwich.
GALLOWAY (Principal G.), St. Mary's College, St. Andrews, N.B.
GARCKE (E.), Ditton House, nr. Maidenhead.
GEIKIE-COBB (Rev. Dr. W. F.), 26 Drayton Court, S.W. 10.
GIBSON (Prof. J.), Bron Hwfa, Bangor, Wales.
GIBSON (Prof. W. R. B.), The University, Melbourne, Australia.
GOLDSBOROUGH (Dr. G. F.), Church Side, Herne Hill, S.E.
GORDON (Rev. A. G.), Kettle Manse, Fife.
GRANGER (Prof. F.), University College, Nottingham.
GREGORY (J. C.), 3 Oak Villas, Bradford.
GREIG (J. Y. T.), Armstrong College, Newcastle-on-Tyne.
GUNN (Prof. J. A.), The University, Melbourne, Australia.

HALDANE (Rt. Hon. Viscount), 28 Queen Anne's Gate, London, S.W.
HALLETT (H. F.), The University, Leeds.
HAMPTON (Prof. H. V.), Karnatak College, Dharwar, Bombay, India.
HARDIE (R. P.), 13 Palmerston Road, Edinburgh.
HARDIE (W. F. R.), Corpus Christi College, Oxford.
HARE, (Miss K. C.), 3 Albany Terrace, London, N.W. 3.
HARRIS (Dr. C. R. S.), All Souls' College, Oxford.
HARVEY (J. W.), The University, Birmingham.
HASAN (Prof. Dr. S. Z.), New College, Oxford.
HAYDOCK (G. H.), The University, Glasgow.

HAZLITT (Miss V.), 50 Southwood Lane, Highgate, N.
HEADLY (L. C.), House on the Hill, Woodhouse Eaves, Loughborough.
HEATH (A. E.), 20 St. James' Road, Liverpool.
HENDERSON (C. G.), c/o Secretariat, Bombay, India.
HENSON (B. L.), Downing College, Cambridge.
HETHERINGTON (Prof. H. T. W.), The College, Glasgow.
HICKS (Prof. G. D.), 9 Cranmer Road, Cambridge.
HOERNLÉ (Prof. R. F. A.), The University, Johannesburg, South Africa.
HOOPER (S. E.), Glen Cottage, Cookham Dean, Berks.

JANVIER (Rev. C. A. R.), Ewing Christian College, Allahabad, India.
JEVONS (Dr. F. B.), Bishop Hatfield's Hall, Durham.
JOACHIM (Prof. H. H.), New College, Oxford.
JOHNSON-SMYTH (Mrs.), Parva Domus, Cherry Garden Rd., Canterbury.
JONES (Prof. W. Jenkyn), University College, Aberystwyth.
JONES (Rev. Dr. W. Tudor), 14 Clifton Park, Bristol.
JOSEPH (H. W. B.), New College, Oxford.

KARPUR SHRINIVASA RAO (Raja), Sabha Bhushana, Chamarajapet, Bangalore, India.
KEANE (Rev. H.), Stonyhurst College, Blackburn.
KEATINGE (Dr. M. W.), Tommy's Heath, Boar's Hill, Oxford.
KEELING (S. V.), Trinity College, Cambridge.
KELLY (REV. A. D.), Kelham Theological College, Newark-on-Trent.
KEYNES (Dr. J. N.), 6 Harvey Road, Cambridge.
KIRKBY (Rev. Dr. P. J.), Rectory, Chorley, Lancashire.
KNAPTON (Rev. A. J.), Clee St. Margaret Vicarage, Craven Arms, Salop.
KNOX (Capt. H. V.), 3 Crick Road, Oxford.

LAING (B. M.), The University, Sheffield.
LAIRD (Prof. J.), The University, Aberdeen.
LATTA (Prof. R.), 14 Crick Road, Oxford.
LAW (Rev. R. H.), The Rectory, Lazonby, Cumberland.
LEE (A.), Hartley College, Whalley Range, Manchester.
LEGGE (A. E. J.), The Athenæum, Pall Mall, S.W.
LIBRARIAN (The), Bedford College, N.W. 1.
LIBRARIAN (The), The University, Bratislava, Czechoslovakia.
LIBRARIAN (The), The University, Jerusalem, Palestine.
LIBRARIAN (The), The University, Lwów, Poland.
LIGHTHALL (W. D.), 34 Royal Insurance Building, Montreal, Canada.
LILLIE (Dr. R. A.), 85 Great King St., Edinburgh.
LILLIE (Prof. W.), Murray College, Sialkot, Punjab, India.
LINDSAY (Prof. A. D.), Balliol College, Oxford.
LINDSAY (Rev. W. T.), 33 Hollygrove, Ballyhinny, Newtownards, Down Co.
LOVEDAY (T.), Vice-Chancellor, The University, Bristol.
LUTOSLAWSKI (Prof. W.), Jagiellonska, 7 m. 2, Wilno, Poland.

MABBOTT (J. D.), St. John's College, Oxford.
MACBEATH (Prof. A.), Queen's University, Belfast.
MACE (Mrs.), 11 Netherhall Gardens, Hampstead, N.W. 3.
McDOUGALL (Prof. W.), Harvard University, Cambridge, Mass., U.S.A.
McINTYRE (Dr. J. L.), Abbotsville, Cults, Aberdeenshire.
MACKAY (Prof. D. S.), 101 N. Irving Bvd., Los Angelos, Cal., U.S.A.
MACKENZIE (Prof. J. S.), 2 Hertford St., Cambridge.
MACKENZIE (Sir W. L.), 14 Belgrave Place, Edinburgh.
McKERROW (J. C.), 34 Cartwright Gardens, W.C. 1.
MACKINTOSH (Prof. H. R.), 81 Colinton Road, Edinburgh.
MAIR (Prof. A.), 26 Parkfield Road, Liverpool.
MALLET (E. H.), 14 St. James's Square, Bath.
MANCHESTER (Right Rev. Bishop of), Bishop's Court, Manchester.
MANNING (W. H. O.), Queen's University, Belfast.
MARETT (Dr. R. R.), Exeter College, Oxford.

MARSHALL (Mrs. D. H.), Ovingdean Hall, Brighton.
MARSHALL (D. A.), 66 Castle Road, Cathcart, Glasgow.
MARSHALL (H. Rutgers), Century Assn., 7 West 43rd Street, New York.
MEADE (Miss A.), Owthorpe, Headley, near Epsom, Surrey.
MOBERLY (Principal W. H.), The University, Manchester.
MORGAN (Rev. W. H.), Ystrad Vicarage, Fallinfach, Cardigan.
MOORE (Prof. G. E.), 86 Chesterton Road, Cambridge.
MORIKAWA (Prof. C.), Ryukoku-Daigaku, Nishi-rokujo, Kyoto, Japan.
MORELLI (Prof. J. B.), Canelones 982, Montevideo, Uruguay.
MORRISON (Prof. D.), The University, St. Andrews, N.B.
MORRISON (Rev. Dr. W. D.), 38 Devonshire Place, London, W.
MOSES (Rev. D. J.), Ammon Villa, Gurnos, Ystalyferan, South Wales.
MUIRHEAD (Prof. J. H.), The University, Birmingham.
MURE (G. R. G.), Merton College, Oxford.
MURRAY (J.), Christ Church, Oxford.

NAIRNE (Prof. A.), Jesus College, Cambridge.
NEALL (R.), 20 Alpha Road, Cambridge.
NUNN (Dr. T. P.), Day Training College, Southampton Row, W.C.

OAKELEY (Miss H. D.), 27 Gordon Square, W.C. 1.

PATON (H. J.), Queen's College, Oxford.
PEARSON (Miss E. A.), Budbury Farm, Bradford-on-Avon, Wilts.
PICKARD-CAMBRIDGE (W. A.), Worcester College, Oxford.
POLLOCK (Sir F., Bart.), 21 Hyde Park Place, London, W.
PORTEOUS (A. J. D.), Simla Lodge, Haddington, Scotland.
PRICE (H. H.), Trinity College, Oxford.
PRICHARD (H. A.), Trinity College, Oxford.
PRINGLE-PATTISON (Prof. A. S.), The Haining, Selkirk, N.B.

QUICK (Canon O. C.), The Abbey, Carlisle.

RABY (J. P.), 117 Woodstock Rd., Oxford.
RAINER (A. C. A.), 51 Merchiston Crescent, Edinburgh.
RAHDER (J.), 24 Oldenbarneveltlaan, The Hague, Holland.
RAMANATHAN (Rao Bahadur K. B.), 16 Venkatachala St., Triplicane, India.
READ (Prof. C.), Wood Lane, Birmingham Road, Solihull, Birmingham.
REID (L. A.), 8 Marine Terrace, Aberystwyth.
RELTON (Rev. Dr. H. M.), The Vicarage, Isleworth, Middlesex.
RICHARDSON (C. A.), Willow House, Whalley, Blackburn.
RINGWALT (R. C.), Mount Vernon, Ohio, U.S.A.
RIVETT (Miss D. M.), McIntosh St., Gordon, Sydney, Australia.
ROBINSON (Prof. A.), Observatory House, Durham.
ROSS (Prof. G. R. T.), Government College, Rangoon, Burma.
ROSS (W. D.), Oriel College, Oxford.
ROTH (Dr. H. L.), The University, Manchester.
ROWLANDS (Prof. W. S.), Robertson College, Jubbulpore, India.
RUSSELL (Hon. B. A. W.), Trinity College, Cambridge.
RUSSELL (Prof. L. J.), The University, Birmingham.
RYLE (G.), Christ Church, Oxford.

SCHILLER (Dr. F. C. S.), Corpus Christi College, Oxford.
SCOTT (Miss E. S.), Education Department, The University, Birmingham
SCOTT (Prof. J. W.), University College, Cardiff.
SETH-SMITH (Rev. F.), Revonah, Radlett, Herts.
SHAND (A. F.), 1 Edwardes Place, London, W.
SHEARMAN (Dr. A. T.), University College, London, W.C.
SHEBBEARE (Rev. C. J.), Stanhope Rectory, Durham.
SHELTON (F. D.), Rosedale, Alberta, Canada.
SHELTON (H. S.), 151 Richmond Road, Twickenham.

SIDDHANTA (A. K.), 33 Amherst Street, Calcutta, India.
SIDGWICK (A.), Trewoofe Orchard, St. Buryan, Cornwall.
SIDGWICK (Mrs. H.), Fisher's Hill, Woking, Surrey. *Hon. Member.*
SMITH (A. H.), New College, Oxford.
SMITH (Prof. J. A.), Magdalen College, Oxford.
SMITH (Prof. N. Kemp), The University, Edinburgh.
SORLEY (Prof. W. R.), St. Giles', Chesterton Lane, Cambridge.
STAPELDON (W. O.), 7 Grosvenor Avenue, West Kirby, Liverpool.
STEBBING (Miss L. S.), 27 Belsize Park, N.W. 3.
STEWART (Prof. J. A.), 14 Bradmore Road, Oxford.
STOCKS (Prof. J. L.), The University, Manchester.
STOKES (Prof. G. J.), 10 St. John's Road, Penge, S.E. 20.
STOUT (A. K.), University College, Bangor.
STOUT (Prof. G. F.), Craigard, St. Andrews, N.B. *Hon. Member.*
STRONG (Prof. C. A.), c/o Crédit Lyonnais, 19 Boulevard des Italiens, Paris.
STRUTHERS (L. G.), Igguldene, Sandwich, Kent.
STURT (H.), 5 Park Terrace, Oxford. *Hon. Member.*
SUTTON (C. W. H.), Christ Church, Oxford.

TITCHENER (Prof. E. B.), Cornell University, Ithaca, N.Y., U.S.A. *Hon. Member.*
TOLANI (Prof. M. N.), Institute of Philosophy, Amalner, Khandesh, East India.
TURNER (J. E.), 55 Allerton Road, Mossley Hill, Liverpool.

WADIA (Prof. A. R.), University, Mysore, India.
WALKER (J.), Wooldale, Thongsbridge, Huddersfield.
WALKER (Rev. L. J., S.J.), Campion Hall, Oxford.
WALLEY (J. T.), Chardleigh Green House, Chard, Somerset.
WARD (A. B.), Endcliffe Vale Road, Sheffield.
WARD (S. B.), 35 Broad St., Wokingham.
WARREN (Mrs. Fiske), 8 Mount Vernon Place, Boston, U.S.A.
WATERHOUSE (Prof. E. S.), The College Villa, Richmond Hill, Surrey.
WEBB (Prof. C. C. J.), Walnut Tree House, Marston, Oxford.
WELDON (T. D.), Magdalen College, Oxford.
WHETNALL (Miss E. M.), Cranford Hall, nr. Hounslow, Middlesex.
WIDGERY (A. G.), S. Catharine's College, Cambridge.
WIGHTMAN (S.), 10 Silver Birch Avenue, Fulwood, Sheffield.
WHITCOMB (P. W.), Shawnee, Osborne Road, Walton-on-Thames.
WHITEHEAD (Rev. L. G.), Selwyn College, Dunedin, N.Z.
WILSON (S. F.), 2 Sherwood Street, Warsop, Mansfield, Notts.
WOHLGEMUTH (Dr. A.), Rutland Lodge, Mary's Hill Rd., Shortlands, Kent.
WOLTERS (Mrs. G.), 45 Albert Road, Caversham, Reading.
WOODS (Miss A.), St. Ives, Cross Path, Radlett, Herts.

Those who wish to join the Association should communicate with the Hon. Secretary, Mr. G. R. G. MURE, Merton College, Oxford; or with the Hon. Treasurer, Dr. F. C. S. SCHILLER, Corpus Christi College, Oxford, to whom the yearly subscription of sixteen shillings should be paid. In return for this subscription members receive MIND gratis and post free, and are entitled to buy back-numbers both of the Old and the New Series at half price. Members resident in America can pay their subscription ($4) into the account of the Hon. Treasurer (Dr. F. C. S. Schiller) at the Fifth Avenue Bank, 44th Street, New York.